By Horatio J Snelling

ANTI

DARWIN

.....

BY THE

Author of "Ceylon, Ancient and Modern."

Illustrated.

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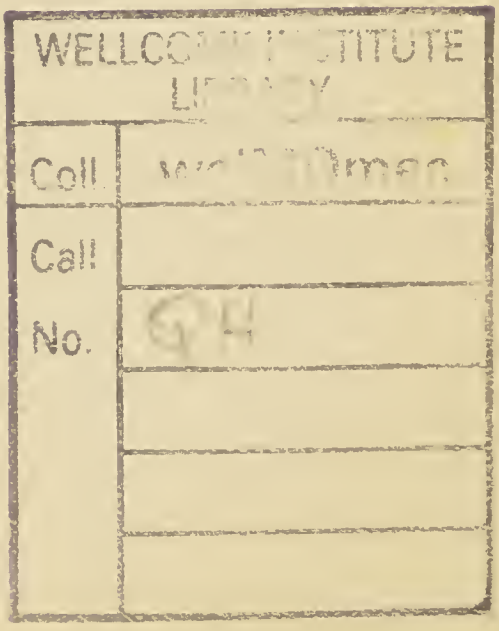

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NOTE to Second Edition—This edition has been so thoroughly revised, it is almost a new work. Admitting the hypothesis of Natural Selection to be true; it is evident, there would be as much, if not more, creative foresight in the development of the Animal World through the evolution of species; than if it had been created as described in Genesis. Unless we adopt the theory of chance, the Plan or design must exist before the thing created, and the archetypes are irrefragable evidence of a pre-arranged plan. However some of Mr. Darwin's followers are beginning to see that his hypothesis is imperfect, and suggest a new theory of the origin of species. So that after all Creation is nearly as much a mystery as ever. [See the "Fortnightly" Sept. 1886. and J. Linn. Soc.]

It is twenty five years since the great Anthropological Society of Paris was founded, and similar societies have since been established in the principal European Capitals, all actively engaged in trying to solve the problem of primal man: yet it is admitted. "Little has been done

towards a solution of the question; the facts we have before us tell neither in one way or the other."

If man is only a developed ape, how could he have any ideas beyond those of an animal? It is impossible to believe the lofty sentiments and heavenward desires of the human mind could emanate from a mere animal—the idea of another and a better world than this, could never have originated with a mere animal. Revelation alone can account for it.

> "To all that breathe the airs of heaven,
> Some boon of strength has nature given.
>
> ... ...
>
> To man she gave the flame refined,
> The spark of heaven—a thinking mind!"
>
> Anacreon Ode xxiv.

The development of organisms, through the evolution of species, is only a part of creation; the greater mystery, of the origin of life, and mental phenomena, Mr. Darwin admits is beyond his power to explain. (*v.* pp. 108 151 2, 188.)

INTRODUCTION

Poor race of men says the sceptical spirit,
A fig for your 'primal fall.'
Some graces ye may inherit,
But the trace of the ape is over them all.

Man's progenitor was but an ape!
That is a delemma we cannot escape;
And women's charms, only, we must own,
The developed beauties of the baboon!

The.....chimpanzee,
Transformed into Venus 'Αναδυομενη!
Thus write some modern sages;
Who have opened in man's history several
new pages. [Apud Moore.]

In 1859 Mr. Charles Darwin published a work

called "The Origin of Species," in which he tries to solve the mystery of Creation by the hypothesis, that all animals, and plants, have been gradually developed from a few primal forms, through a process he calls, "Natural Selection, or the Survival of the Fittest," founding his argument on the changes produced in animals, and plants, since their domestication with man. Mankind have not been exempted, and their descent from some of the ape family, thought to be quite evident. [1]

So fascinating has this theory been to many people: Darwinism has become a creed: counting numerous enthusiastic votaries in every land; who hail it as a sort of revelation, the key that opens the mysterious portals of nature. They seem almost as delighted at

NOTE

[1] Mr. Darwin says little about the evolution of man from an ape, in 'The Origin of Species.' It was not untill 1871, that he published his ideas on this subject in "The Descent of Man." However in the mean time Professor Huxley had discussed the question, from a similar point of view, in his work, named 'Man's place in Nature:' it was also suggested by LAMARCK in his *Philosophie Zoologique.* (*vide* p.6.)

the discovery, as Ulysses when he, at last, sighted the island of Ithaca after all his wanderings, and gave vent to his feelings in the words,—

Χαιρ' Ιθακη, μετ αενθλα, μετ αλγεα πικρα
Ασπασίως τεον ουδας ἱκανομαι.

Which we venture to paraphrase, after Moore.[1]

Hail—thou portal of nature!
To seek thee we' need no longer sigh;
Darwin, at last, has brought us nigh.

Thus launched on the vast ocean of evolution:

That dark and endless sea!
Their thoughts as boundless;
And of old notions free. ⁝
[Apud Byron "The Corsair."]

They have out-sailed their pilot, and imagine all animal life has been evolved from "primal atoms, or protoplasm.' Such as *Bathybius* or *Protobathybius.* ⁝

NOTES

[1] See his "Travels of an Irish Gentleman."

⁝ Terms given by M M. Hæckel and Huxley to a

The present state of the question may be summed up in the following lines,—

Who was the father of mankind ?

Adam saith Moses:
A monkey—Darwin supposes,
Quoth his pupils don't you see;
A Bathybius it must be !

Although the theory of evolution is generally attributed to Mr. Darwin, it did not originate with him. Several philosophers have tried to explain the mystery of Creation on what are called scientific principles.

In 1848 a work named "Vestiges of Creation" appeared, in which the author surmises that, "all existing forms of living beings have been produced by the gradual modification of pre-existing species."

NOTE

slimy substance dredged up from the depths of the N. Atlantic by the naturalists of the exploring ship *Porcupine*, which although formless, is said to have exhibited spontaneous movements. As the naturalists of the *Challenger* expedition failed to obtain any of this *marvellous* substance its reality is doubted. See Reports Brit. Asso. 1877—9. Hæckels His. of Crea. &c.

The author in the appendix to his XI edition 1860, says he "cannot see much difference between his theory and that of Mr. Darwin, except, that he had not tried to explain how the modification of species occurred." Mr. Darwin admits,—"it had done good work in preparing the ground for him."

In 1858 Mr. A. R. Wallace then in the Indian-archipelago, sent home a paper on the evolution of species; his ideas being in many respects, almost identical with those of Mr. Darwin. This lead to papers from both authors, being read to the Linnæan Society in the summer of the same year, and to the subsequent publication of the Origin of Species which had been deferred for some years; "as the time was not considered ripe enough for its publication."

The Transactions of the Zoological Society Vol. iv, contain a memoir by Professor Robert Owen, "On the extinction of species through a struggle for existence,"—which is the correlative of Mr. Darwins proposition, that "Extinction and natural selection go hand in hand." [*See also Owens Palæontology.*]

Lord Monboddo a Scotch philosophical writer at the end of the last century, Buffon, and Lamarck, have all propounded evolution hypothesis.

M. Lamarcks ideas and arguments are very similar to those of Mr. Darwin. For instance Lamarck who

imagined man is a developed orang-outang !—says in his *Philosophie Zoologique*, published in 1801. "*There can be no doubt, that if any of the quadrumana were by any force of circumstances to cease climbing trees: and were compelled, through a number of generations to walk only on their feet, they would eventually, be transformed into bimana.*" [1]

A similar argument is used by Mr. Darwin to show

NOTE

[1] "Effectivement, si une race quelconque de quadrumanes...perdoit par la nécessité des circonstances, ou par quelque autre cause, l'habitude de grimper sur les arbres,...et si les individus de cette race pendant une suite de générations, étoient forcés de ne se server de leurs pieds que pour marcher; et cessoient d'employer leurs mains comme des pieds: il n'est pas douteux, d'après les observations exposées dans le chapitre prècèdents que ces quadrumanes ne fussent á la fin transformès in bimanes." Première partie. 349.

Lamarçks supposition, that there is nó dualism in animal and vegetable life. (p. 377.) has been verified by recent experiments: but his "continued spontaneous generation theory," is rejected by seience. (*v.* Ch. ii.)

how short-legged dogs, could be transformed into long-legged species. Or why the ostrich has lost the power of flight in accordance with his theory on the effects of use and disuse on organs.

The ideas of Lamarck created some stir among French Naturalists of his day, and were adopted by Geof. Saint Hillaire—but seem to have made no permanent impression.

Cuvier in his "*Histoire des Sciences Naturelles,*" published in 1840, points out that Lamarcks theory, was only, a resuscitation in the XIX century, of the opinions of Anaximander a Greek Philosopher who lived 610 years before our era. He says "Nous retrouverons ce système dans les temps très rapprochés des nôtres, et même dans le dix-neuvième siécle."

Anaximander seems to have been the first who applied the hypothesis of evolution to account for Creation. His works have all been lost in the general wreck of ancient literature, but various quotations from them by Plutarch, and others, enable us to form some idea of his theory.

Anaximander imagined that the primal world was a globular mass of mud which the suns rays fermented, and thus engendered the first animals, such forms, as could only swim, or move in the half liquid mass. Eventually, when the mud had hardened into dry land—man emerged, in a more or less, adult state

from some *fishy creature*—Man he said, is so helpless a being in his infancy, he could not originally have existed as an infant; and must have had a different form or nature (εξ αλλοειδων.)[1]

It is a curious circumstance that the idea of Anaximander should exist among the Basutos of South Africa, who are said, to believe that, "man originally sprung up in a marshy place among reeds." :

A singular work was written in 1655, by Peyrère a French Calvinist, to prove from the 5th Chapter of St. Pauls Epistle to the Romans, "that there had existed nations and races of men before Adam, and that he was

NOTE

[1] Αναξιμανδρος εν υγρω γενηθηαι τα πρωτα ζωα. Plutarch *De Placites Phil.* v. *19. Sympos.* viii. *8. 3. Orig. Phil.* c.*6.* Eusebius *Enag. pro. l.c,1.8.* Smith Biog. *Nouvelle Biog. Univ.*

Censorinus a Roman naturalist, who lived in the III century A.D., wrote a work on the generation of man, entitled "*De die Natali*,"[first printed at Bologna in 1497,] in which he mentions that, Anaximander said fish-like animals, engendered in heated mud and water, gave birth to human beings arrived at a state of puberty. Lyell's Geology. : Spencer Sociology. p.379,

but called the first man, because the law commenced with him."[1]

This work was one of the first attempts to solve the alleged difficulty of reconciling the Cosmogony, and some statements of the Bible, with geological facts and science—man and the animal creation having evidently existed much longer than Genesis would lead us to suppose.

It should be remembered however; that Moses does not specify any date, for the events he records in the first part of Genesis. He merely says, "In the beginning,"and his description implies a gradual creation from chaos—also traditions may have existed in his time, which have since been lost. ⁝

The Hindus from time immemorial have stigmatised

NOTE

[1] *Præadamitæ sive Exercitatio super cap.* v. *Epist. Paul ad Rom.* [Quoted by Moore in his Irish Gen.]

⁝Moses in Genesis vi. seems to allude to two antediluvian species of mankind, whose intermarriage gave birth to "giants."

Moores poem,' The Loves of the Angels,' is founded on a similar idea which existed among the Persians and Sabean Gnostics. *vide* D'Herbelot.

all aboriginals as monkeys, but whether from disdain or some glimmering idea of their descent from an ape we are unable to say.[1] One can however gather from the ancient literature of the Hindus, that its authors belived the world has been gradually developed to its present condition, and inhabited by a succession of creatures, suited to its varied phasis—First there were fishes, then came amphibia, and finally mammalia. In the account of the creation of the world by Brahma the Hindu Creator, in the Ordinances of Menu, it is stated to have been at first covered with water, formless and void. A description similar to that in Genesis.

The "Vishnu Puràna" describes Vishnu "The Preserver," as having visited this globe at successive periods in the form of a fish, a tortoise, and a boar. ⁝

These curious transformations remind one of the

NOTE

[1] The "monkeys" under their leader Hanuman who played an important part in Ràma's invasion of Ceylon are supposed to have been Veddas, or aboriginal jungle men from Southern India. *vide* 'Ràmayana & Mahab.' A species of Presbytes (*Semnopithecus entellus*) found all over India, and considered by the Hindus the most intelligent of all apes, is called by them "Hanuman."

⁝ Wilson's Puránas.

doctrine of transmigration—which is only a species of evolution, or metamorphosis of beings from one form to another: each change making them more perfect.

Epicurus taught the Atomic theory, also Kapila, who imagined the world originated in a combination of atoms, and hardly recognised any being superior to man. Although this Hindu philosopher is rather a mythical person, who is supposed to have lived about the first century A. D., his doctrines are, more or less, indicated in early Sanskrit literature. [Colebroke's Hindu Phil.]

From the previous pages it will be seen that some of the propositions of modern evolutionists, were propounded ages ago by Anaximander—His idea of the origin of *Protozoa*, is identical with M. Hæckels theory, that they were spontaneously generated in the bed of the sea by a sort of chemical process, similar to the formation of saline chrystals in water."

Then the idea that man is the offspring of some fish-like animal—is similar to Mr. Darwin's version, that "Quadrupeds and all the higher mammals are derived ... ...from some fish-like creature."

We know a deal more than of yore, about the earths crust, and the nature of its former inhabitants, but it is doubtful if we really know much more, how they were created—Why for instance, the same ocean should deposit in the same place, at one time carbonate of lime, and at another time, quite a different substance ?

Plutonists and Neptunists, are still disputing about the origin of rocks, and scientific men are any thing but agreed on many kindred subjects. See the controversy that has been for years, about the *Eozoon Canadense*, which some suppose to be the oldest of organic beings, while others say it is not an animal at all!—Mr. Darwin says, 'for its class, it was a highly organised animal.'

Sir J. Lubbock says he believes there are many who consider, that according to Darwin's theory, a sheep might turn into a cow, or a zebra into a horse.

It may seem ridiculous to him, but it would be a natural inference to draw, by the uninitiated in the mysteries of natural selection, who do not know that it can only work within certain lines.

Mr. Darwin very fairly states many of the difficulties in his theory, that have occurred to himself or have been urged by others. He never displays the zeal bordering on intolerance, shown by some of his disciples, who seem to think, they, the High Priests of Darwin, are alone entitled to give an opinion on the subject. Acting on Cicero's principle, who says "when religion is in question, I do not consider what is the opinion thereon of Zeno, Cleanthes, or Chrysippus, but what the Chief Pontiffs say of it." (*De Nat. Deorum lib. 3.*)

The following lists of rocks, and divisions of the Animal Kingdom are given for reference.

The earths history is divided geologically, into three chief periods—The Primal or Palæozoic, the Secondary or Mesozoic, and Tertiary. These are sub-divided into minor periods, called Cambrian, Silurian, Jurassic, Carboniferous &c.

Some of the terms are Greek. Palæozoic being from *παλαιως* ancient, and *ζωα* life. Mesozoic means middle life, a term equivalent to the 'middle ages' of history.

The sub-divisions of the Tertiary period were named by Sir Charles Lyell. The first being called Eocene from, *ηως* or dawn, to indicate the dawn of existing *Testaceous* fauna. Miocene, is from *μειον* less recent, and Pliocene, from *πλειον* more recent. The fourth division is variously termed Pleistocene, Glacial post-Tertiary. &c.

New names originating with Professsor Dana and American geologists, have lately been applied to the chief periods, which they call Primordial, Archæn, and Kainzoic, from *καινος* new. Some say there is no evidence of a pre-Silurian, age or any identity between British pre-Cambrian, and any American group.

Rocks are divided into two classes, the Igneous and Aqueous, or sedimentary. The igneous such as granite, which form the inner crust, are due to heat and are unstratified. The aqueous which are owing to the action of water, are all stratified *i.e.* in layers.

The palæozoic period commences with the lowest of

the stratified rocks, no sign of life having been detected in the igneous, or metamorphic rocks as they are called by Sir C. Lyell.

Table showing the order in which rocks occur.

Tertiary	Post-Tertiary.	*Glacial deposits, caves, peat moss.*
	Pliocene.	*Lacustrine deposits.*
	Miocene.	*Lignites, Silwalik beds of India.*
	Eocene.	*London clay, gypsum.*
Mesozoic	Cretaceous.	*Chalk cliffs, green sand stone.*
	Jurassic.	*Jura lime stone, Portland stone.*
	Trias.	*New red sand stone, marl.*
	Permian.	... ...
Palæozoic	Magnesian-lime-stone, and marl.	
	Carboniferous.	*Coal fields.*
	Devonian.	*Old red sand stone.*
	Silurian.	*Lime stone, flags.*
	Cambrian.	*Slate rocks.*
	Lower-Cambrian,	equivalent to Huron of Canada, eighteen thousand feet thick.

Table showing the order in which fossils occur.

Mankind	... ...	Post-Tertiary	
Sirena	*Dugongs Manatees*	Pliocene	*Tertiary*
Quadrumana	*Macaques Hylobates*	Miocene	
Carnivoria	*Bears Hyenas*	Eocene	
Cetaceans	*Whales Dolphins*	,,	
Snakes (sea)	*Palæophis*	,,	
Cheiroptera	*Bats Pteropus*	,,	
Rodents	*Marsupials Deer*	,,	
Saurians	*Crocodiles Lacertina*	Cretaceous	*Mesozoic*
Pterodactyles	... ...	,,	
Birds	*Archæopteryx*	Jurassic	
Mammals	various and numerous	,,	
Ichthyosaurians	fish-lizards	Lias	
Plesiosaurians	... ...	,,	
Dinosaurians	bird-lizards	Trias	*Palæozoic*
Marsupials	(small)	,,	
Chelonia	*Turtles*	Permian	
Labyrinthodons		Carboniferous	
Insects	*Bees Flies moths*	Devonian	
Fish	*Dog & mud-fish*	,,	
Shell-fish	*Nautilus bivalves*	Silurian	
Crustacea	*Cray-fish*	Cambrian	
Zoophytes	*Corallines*	,,	
Protozoa	*Foraminefera*	,,	

Divisions of the Animal Kingdom

The Animal World, comprises two primary sections, The *Vertebrates* and *Invertebrates*, divided into six SUB KINGDOMS, which are again divided into classes.

INVERTEBRATES

I SUB KINGDOM.

Protozoa.

Animalcules, such as Rhizopoda and Foraminefera.

II SUB KINGDOM.

Cœlenterata.

Zoophytes, Corallines, Jelly-fish, Lubbers &c.

III SUB KINGDOM.

Annuloida.

Star-fish, Liver fluke, Sea-urchins, Thread worms.

IV SUB KINGDOM.

Articulata.

Crustacea, Leeches, Flies, Locusts, Spiders, Beetles, &c.

V SUB KINGDOM.

Mollusca

All kinds of shells, Octopus, Nautilus &c

VERTEBRATES.

VI SUB KINGDOM.

Fishes, Reptiles, Birds, and Mammals.

ANTI
DARWIN

CHAPTER I.

HOW WAS THE ANIMAL WORLD CREATED

We indeed, should be undoubted sages,
If all about Dame Nature's early days,
we only knew.
But alas !—the hoary mist of ages;
Hopelessly obscures that distant horizon
from our view.

Palæontology seems to prove that existing animals, are in great measure, modifications of pre-existing species; a vast number of strange creatures having vanished from this earth.

The question then arises,—How was the animal world created?

Few naturalists now adhere to the old idea of creation; the Evolutionists have it all their own

way; evolution in some form, being generally accepted, * although many refuse to carry the theory to the length of making mankind the offspring of an ape.

Mr. Darwin's hypothesis is, that animals and plants, have not been created separately, but evolved from one or more primal forms.

It is in reality of no consequence, how the animal world came into existence, whether individually or through evolution of species; we can in either case, recognise the hand of a Creator in the work, which M. Darwin's theory ignores.

* We cannot refrain from quoting here the following witty passage in the Earl of BEACONSFIELD'S "Tancred," referring to the theory of the author of "Vestiges of Creation." "You know all is development. The Principle is perpetually going on. First there was nothing, then there was something—I forget the next, I think there were shells, then fishes then, we came. Let me see, did we come next? never mind that; we came at last. And the next change there will be something very superior to us—something with wings. Ah! that's it; we were fishes, and I believe we shall be crows!" Mr. A. Wilson says

His theory amounts to this. Many hundred millions of years since, a low form of life appeared somehow, on the earth then void. After a time, as the conditions of existence changed, some of these protozoa changed their nature, and their offspring have continued to change, more or less, ever since—while the REST remained unchanged to this day.

Why ALL the protozoa did not alter is a mystery, unless we conclude the developement was regulated by a Supreme Will.

We are not prepared to say, there has been no evolution of species. Even according to Genesis all the varied races of existing men are the offspring of one man, and there is nothing in the Mosaic record to exclude the idea that existing animals have been formed from pre-existing fauna—but without some Supreme Control directing its operations—the theory of

"The grandeur of the creative work as demonstrated by evolution, is only paralelled by the newer, and higher conceptions which that theory instils of the wisdom marking Infinite Mind."

evolution is quite as incredible, as the old idea of creation is alleged to be.*

It seems very probable that evolution has done its work, and died out. This supposition, would clear up many difficulties in the theory. How else can the immutability of all existing species be explained?

It is said "Transformism remains in possession of the field, the only alternative being the supposition that animals have been fabricated separately." [Huxley "The Crayfish." p. 346.]

If animals have not been formed separately, in thousands of cases, the development of species has been arrested at certain stages, where a line has been drawn, beyond which they have not passed from the most remote period, which

*Professor Nicholson of Toronto, says Palæontology points in the main, to the existence of some general law of evolution, whereby later forms have been developed from older ones. That this law has acted along with, and sometimes been counteracted by some other, and as yet obscure law, regulating the appearance of new types, seems equally certain...We find unmistakable

is equivalent to a separate creation—Who drew these lines?—Can they be accidental?

One thing is certain, Natural Selection cannot develope vast numbers of species beyond well defined limits.

If every animal has not been "separately fabricated," the archetypes are distinct creations, and the evolution of species is limited to these lines, which is quite inconsistent with a theory of uncontrolled developement, which would make fixity of type impossible, as there would be a constant, and universal modification of forms, and archetypes going on.

There is an essential difference in the arche-

evidence of the operation of some law of evolution, while we find ourselves confronted with phenomena. which in the present state of our knowledge, appear irreconcilable with its universal, or exclusive action. It will not do to adopt some hard and fast theory on this subject, bringing forward prominently all the facts favouring the theory, and keeping in abeyance facts pointing in other directions." He thinks however that "evolution in the shape presented by the master mind of Darwin is an indispensable working hypothesis."

type of each division of the Animal World, each being formed on an entirely different plan, from which there has been no deviation since Palæozoic times, most of the archeytpes having existed since the dawn of life. *

Mr. Darwin seems unable to explain how the archetypes originated?—and leaves it an open question whether there were originally, only one, or—five, distinct forms, or progenitors.

He says "analogy leads to the belief that all animals are descended from some one primordial form: But analogy may be a deceitful guide. I believe animals are descended from at most, only four or five progenitors,...that is immaterial...we have distinct evidence that within

*Professor Nicholson says, "All animals in any one Sub Kingdom agree with one another in their structural type, or in the fundamental plan upon which they are formed, but differ in a modification of a common plan. No comparison is possible between animals belonging to different sub-divisions. As their distinctive characteristics are the result of a modification of two essentially different plans." See his Palæontology. v. i. p. 93. ed. 1879.

each kingdom, all members are descended from a single progenitor." [p. 424 ed. 1878.]

Five distinct progenitors is equivalent to five separate creations: and seeing that their fundamental difference in type, has been, more or less,—maintained in the almost endless modifications of a common plan,—in their descendants, we have the proof of a PRE-arranged scheme, and a Supreme control in creation. *

At page 80, Mr. Darwin says "All beings are formed on two great laws. Unity of type, and conditions of existence. By unity of type, is meant that fundamental agreement in structure of all beings in the same class, quite independent of their habits...On my theory unity of type is explained by unity of descent."

*Professor Huxley says, "the skeleton of the crayfish shows a unity in diversity such, as if the animal were a piece of human workmanship, would lead us to suppose the artificer was under an obligation..... to subordinate the nature and arrangement of the mechanism to certain fixed architectural conditions." The Crayfish p. 173.

But if there was only one progenitor—How were the other archetypes formed?—if there is an inherent tendency to preserve "unity of type." On the other hand—How could unity of type, be maintained? if as Mr. Darwin says, All beings have an inherent tendency to vary, unless there was some controlling principle, subordinating variation to the maintenance of type. A principle coexistent with life, and which no change of conditions has affected. [*vide* ch. viii.]

Mr. Darwin saw this difficulty when he says there may have been five progenitors. But so far from being immaterial, this is important, as in that case the archetypes must be distinct creations. They could not have been evolved if unity of type was invariably maintained.

As already remarked Natural Selection only works within well defined limits. It has never developed a cephalpoda into a vertebrate, nor a zebra into a horse, because they have been formed on different lines, although they are supposed to be descended from a common ancestor.

If there was not some guiding principle;

evolution instead of working on fixed lines. would have developed a jumble of species. All would be confusion! That Naturalists can classify animals, shows there has been, a guiding principle.

"Order is Heaven's first law, this confessed,
Some are, and must be, greater than the rest."
Pope.

All through creation there ever has been a gradation, all could not rise in the scale of life.

It would be no exaggeration to say, that near one third of the earths crust, such as limestone and coral reefs, is owing to the ceasless labours of countless myriads of minute beings, such as Foraminefera and Zoophytes, who are as necessary a part of nature, as any higher animal, and the permanence of their organism through all the vicissitudes of the globe, is a living proof of a Supreme Intelligence directing natures operations.

If the action of a Creator is to be superseded, What is the motive force, and guiding power, to replace it?—Mr. Darwin's theory is a kind of Pantheism. Natural Selection being, he says,

"An Intelligent self-acting power.....The product of many natural laws...or sequence of events as ascertained by us."[p.83.]

Are we to believe a few primal species, could have developed into all the varied forms of the animal world, in a haphazard way, without any plan, or control, beyond an inexorable struggle for existence?—No the whole of nature presents irrefragable evidence of a pre-arranged plan, which Mr. Darwin's theory practically ignores; making the evolution of species a merely fortuitous circumstance.

How is it that beings, possess "an inherent tendency to vary?"—As there can be no effect without a cause. On this point, Mr. Darwin professes ignorance. At page 107, he says, "there are two factors in variation. The nature of the organism, which is the most important of the two, and the nature of the conditions... This induces me to lay less weight on the direct action of the surroundings, than on a tendency to vary due to causes of which we are quite ignorant."

In his latter editions he says, he has under-

rated, in his early editions, the importance of spontaneous variability." *

Spontaneous variability, seems to be quite as improbable as spontaneous generation. Variation, which is evidently subordinated, to the maintenance of type, and appears to be an effect, rather than a cause, is probably a latent principle implanted by the Creator as part of a pre-arranged design, for the development of the higher organisms, where it is mostly observable. [*vide* ch. viii.xx.]

Professor Huxley says, "When an action arises from conditions developed in an animal body, as we cannot perceive the antecedent phenomena, we call such an act spontaneous... but by such language no rational person intends to express the belief that such acts are uncaused ...self causation is a contradiction in terms."

* Origin of Species. p. 171, ed. 1878 Variation of Species under Domestication Intro. p. 2. ed. 1868. Descent of Man. ed. *1874.*

CHAPTER II.

DARWINS FACTORS.

The theory of Natural Selection although so lauded, leaves us nearly as much in the dark as ever. We know nothing more of the latent principles, exhibited in the marvellous metamorphosis of insects, which insure with unerring fidelity, the successive forms of caterpillar, chrysalis, and moth—Or which transform the tadpole into a frog.

Mr. Darwin admits, "much will long remain obscure. And that Natural Selection is not the exclusive, although the main means of modification." [pp. 4 421.]

Sir J. Lubbock says, "It is one thing to acknowledge that natural selection is the true explanation of certain phenomena, but it is quite another thing to maintain that all animals are

descended from some one primal source: but how far the present condition of beings is due to natural selection?—How far its action has been modified and checked by other natural laws? The unalterability of types, by atavism &c. How many types came originally into being and whether they arose simultaneously, or succesively? These and many other similar questions remain unsolved, even admitting the theory of natural selection, all of which has been pointed out by Darwin himself." [On Insects p. 83.]

Mr. Darwin's theory is based on four axioms.

1—That no two animals or plants are identical in all respects.

2—Offspring tend to inherit the peculiarities of their parents.

3—Of those who come into existence only a small number reach maturity.

4—Those who are on the whole, best fitted for their mode of life, are most likely to have descendants."

The first and second axioms are doubtful in many cases: but the last two are self evident, if the fourth refers to individuals—but not if it

means a class of animals, as shown in chapter iii.

Then comes the question. How has all this produced evolution?

Chiefly, we are told, through. "A struggle for existence resulting in the survival of the fittest."

"A tendency in species to inherit any favourable variation, and turn to profit its new and modified form."

Use and disuse of organs. Changed conditions of life. Sexual selection &c.

Mr. Darwin remarks, "Nothing at first sight can appear more difficult than; that complex organisms have been perfected...by the accumulation of innumerable slight variations, each good to the possessor. But the difficulty, he adds, disappears if we consider and admit the following propositions."

All parts of an organism offer at least individual differences.

That there is a struggle for existence, leading to the preservation of profitable deviations of structure or instinct.

Lastly that gradations in the state of perfection of each organism may have existed, each

good of its kind." The truth of these propositions, I think cannot be disputed.[p. 404 ed. 1878.]

If the second proposition was as evident, as Mr. Darwin thinks, there would be an end of the controversy, as it is the mainstay of his whole theory: but it must be pointed out—firstly, that although the variation of complex organisms might lead to a gradual perfection, there is no scope for a similar modification in the lowest forms; so that his propositions do not explain how they have been perfected? Is it possible the higher animals have been created on a different principle from the lowest? It is evident they cannot have passed through innumerable stages of development—yet many of them, as Mr. Darwin says, "are wonderfully and beautifully organised."[*vide* ch. xx.]

The shell of a foraminefera, is very complex. It is divided into a number of chambers, resembling a nautilus shell, the highest of molluscs, although inhabited by a being, the simplest in nature, mere jelly-like substance; and is formed by an immutable chemical process, that could

not have been acquired by degrees—and which although almost coeval with life—identical with that producing the bones and teeth of mankind.

With some exceptions, all animals, from the lowest to the highest, secrete lime and silica, which is deposited about them in divers ways. It forms the skeleton of the vertebrate, the skin of the crustacea, the shell of the mollusc, and the wonderful stony fabric of the coral forming zoophyte; proving the work of natures "prentice hand," is as perfect as her latest production.

Then take the case of the *Eozoon Canadense*, supposed by some to be a gigantic foraminefera, and "for its class highly organised." If as its name implies, it was the first living creature—It must have come into existence in that state.

There is a curious contradiction in the statements about it, to be pointed out. Its name is derived from ηως or dawn, to signify it was the first born of nature. Yet Mr. Darwin says, "It preyed on other minute beings." ! [*v.* Intro. p. 12]

The previous remarks apply also to instincts which cannot have been acquired by degrees in

very simple organisms: yet the instinct of self-preservation is as inborn, and potent in the animalcule, as in an elephant.

Secondly, Mr. Darwin's theory is founded on the idea, that what occurs among domestic animals and plants, takes place in wild nature: but there is a great difference between the conditions of tame and wild existence. A profitable variation in the eye of a breeder, would be, in most cases, of no use to a wild animal in a struggle for existence. Even among domestic species, what he calls, "profitable deviations of structure," are not accumulative, or preserved beyond a very uncertain and limited degree. It is well known there is nothing so precarious as horseflesh, the best blood cannot be relied on.

The points most useful to a wild animal, such as speed, strength, and wind; are those which breeders find most difficult to secure, or increase. Beyond certain limits they cannot go.

Wild animals are as well able to hold their own in a race for life as of yore. The hound is not swifter, nor the fox more easily outrun.

All this may be taken as a proof that evolut-

ion has died out. There must be a limit to development, as there is to breeding. [*v.* ch. iv ix.]

Unless it can be shown that there is a greater inherent tendency to inherit favourable variations, than there is to transmit disadvantages. How could "profitable deviations accumulate" so as to preponderate?—Is it so with mankind?

There are as many, if not more, hereditary mental and physical infirmities observable in families, as hereditary advantages. Many men succeed in a remarkable way over others in the struggle of life, through their individual advantages, which if they were accumulative, would in a few generations, produce a dominant cast. But very able men seldom have very clever sons, or abnormally tall, or short parents &c. similar offspring. Human parents have no tendency to transmit peculiarities, so as to give their offspring a permanent advantage over others of their kind, and we may conclude it is the same with wild species.

Although "hereditary modification under domestication is possible," it is well known there is great difficulty in preserving good points, high

bred stock has such a tendency to degenerate.

One of the weakest points of Mr. Darwin's hypothesis is—that it does not explain, why so many low organisms, have not developed beyond certain lines, although they must always have been under the same influences, which it is alleged, have changed similar species so much. There has been a general advance in whole classes—yet whole classes are no more developed than at the beginning, which he admits is "a strong argument against" his theory.

"Looking, he says, to the dawn of life when, all beings, as we may believe, presented the simplest structure. How it has been asked, could the first steps in developement have arisen? H. Spencer would probably answer, 'that, as soon as unicellular forms came to be composed of several cells, or attached to any surface, homogenous units become differented in proportion as their relation to incident forces became different'. But as we have no facts to guide us, speculation is useless. It is however an error to think there was no struggle for existence, and consequently no natural selection

till many forms had been produced. Variation in a single species inhabiting an isolated place might be beneficial, and thus a whole mass of individuals might be modified...On our theory the continued existence of low forms offers no difficulty. Natural selection does not necessarily include progressive developement. It only takes advantage of such beneficial variations as arise,...What advantage would it be, as far as we can see, to infusorian animalcules to be highly organised? If it where no advantage, then forms would be left unimproved...I believe many low forms exist from many causes. Favourable individual differences may never have arisen for natural selection to act on...But the main cause is the fact that under very simple conditions of life a high organism would be no service." p.100. At page 146 he says, "It would be exceedingly rash to suppose that, most existing low forms, have not in the least advanced since the dawn of life."

All this is hypothetical enough surely!—and shows, to use his own words, "much yet remains unexplained on the origin of species."

It is strange Mr. Darwin did not see the contradictions go far to destroy his theory.

If the first born of nature had not been perfectly fitted to its conditions of life, we suppose it could not have existed for a moment, or have come into existence at all! Therefore it is difficult to see, how the first step in development arose through its being made more fitted, by "profitable variation?"

At page 6 his remark is quoted, that all beings are descended from at "most five progenitors." Yet he says, "natural selection does not necessarily include progressive developement &c." Unless some favourable variation arose in the primal form, how could any multiplication of species have arisen? But if a struggle for existence, is an indispensable condition in natural selection, this would have been impossible with only one primal form, and the wide world to itself!

Low organisms seem the least likely to have been influenced by any of Mr. Darwin's factors Rhizopoda are evidently a thousand times less likely to vary than an elephant.

That low primal forms were quite fitted, not only, for primal conditions of life, but all after ages, is shown by the fact, that some of them are still extant. Rhizopoda have remained in nearly their present state for enormous periods, a proof no variation could have made them more fitted than they were at first.

Another contradiction must be pointed out. How could natural selection have arisen in an 'isolated species,' when its isolation would have exempted it from the struggle for existence, an indispensable factor?

At page 80 Mr. Darwin says, "As all beings are constantly striving to sieze on each place in the economy of nature, if any species does not become improved in a corresponding degree with its competitors it will be exterminated."

According to this thesis, the first step in evolution would have required the modification of every individual of the primal form if any were to escape extermination. Especially as he says, "the struggle for existence is always most severe with similar kind." Thus the continued existence of simple organisms instead of offer-

ing no difficulty, in his theory, would have been impossible. The unmodified forms could not have survived the competition of the improved species.

Mr. Darwin's theory would be very plausible supposing natural selection had a good start in the world—but the first step would have been the difficulty—How could it have arisen on his own admissions?

If, as he says, there can be no natural selection without a struggle for existence, there could be no struggle for existence, in his sense of the term, with only one primal form.

CHAPTER III.

THE SURVIVAL OF THE FITTEST.

NATURAL Selection, or The Survival of the Fittest, are Mr. Darwin's "metaphorical" terms, for the obvious and fundamental law of nature that every creature is fitted for its place in nature and consequently survives all the adverse circumstances surrounding mundane existence.

He assumes that every creature is more or * less, imperfect and might vary in "a manner

* He says, "In the case of thousands of genera, many more are born than can survive. Individuals having any advantage however slight, over others would have the best chance of survival and procreating their kind: on the other hand any we may feel sure that any variety in the least degree injurious would be destroyed. ...Any being if it vary however slightly in a manner profitable to itself will have a better chance of survival and be thus naturally selected." [p. 63. ed. 1878.]

profitable to itself, but the works of nature are all so perfect; in their normal state, *i e*, not deformed: Is it possible they could be improved by any variation?—Even the animalcule that springs into unseen existence, is as perfect and well fitted for its place as the mammal.* And the admirable fitness of every thing in nature is well illustrated in the fertilization of orchids.

No profit, in Mr. Darwin's sense of the term, could be derived by wild species, from a variation, as it would disturb the balance of power, which is shown in the extermination of native genera by strange species introduced by man. Also because there is a dual principle in nature: thus any favourable variation is counterbalanced by some corresponding disadvantage. For instance feathers are the lightest and warmest, kind of covering, but have the disadvantage of engendering parasites more than any other.

* Can naturalists point out any existing animal that is not in every way fitted for its place in nature? Or which from defective organism is becoming extinct, through purely natural causes?—that is where man is not the cause, directly or indirectly.

A gradual modification of species since the dawn of life, is not a "survival of the fittest, but devolution—or a succession of creatures all fitted for their place in nature, during the epochs in which they existed.

Are we to believe, that nature did not know the kind of animal best fitted for mundane existence at all times, but left it to be settled by a perpetual gladiatory combat among species, all so, more or less, imperfectly fitted for their place in nature, that numbers are continually exterminated in the struggle—yet this is what the survival of the fittest means.

The only logical supposition is that evolution if it be a law of nature, is a mysterious and inherent principle, whereby organisms have gradually changed and, developed with time, as inorganic nature has changed.

The Struggle for Existence.

Mr. Darwin applies the doctrine of Malthus to the whole of creation—a universal struggle for existence producing variation and multiplication of species. "Extinction and natural

selection going hand in hand." There is, he says, "One general law for corporeal and mental developement—multiply, vary. Let the strong live, and weak die."[p. 235.]

There could have been no multiplication of species, if extinction and natural selection, go hand in hand to the extent he implies: to begin with. If the primal form A, was exterminated by its improved offshot B, and B, by C, in succession, there never could have been more than one or two forms, in existence at a time. The vast number of species extant, shows parent forms have survived the competition of modified offspring. Beings are so dependent on each other B, in many cases, could not exist without A.

Mr. Darwin says, the ostrich has been "compensated for its loss of wings by increased power of legs," which is admitting a counterbalancing principle. In accordance with such a law; any advantage gained by B, under a modified form would be counterbalanced in some way, which would enable A to coexist with B. Thus we find the lowest and most noxious animals side by side with the most developed and beautiful.

The counterbalancing disadvantages of B's new form; would be equivalent to the "corresponding improvement" of A, or other competitors, which Mr. Darwin says, is necessary to prevent their extinction: but a corresponding improvement of all competitors, would require such a general developement of forms there could be no inferior genera extant. While under the counterbalancing law; the whole organism of a species may change, and the unaltered genera exist side by side.

Suppose a profitable variation occurred in an individual of a species A, and was inherited; becoming an improved form B,—How would the corresponding modification of its competitors C and D, arise? Are we to believe that a similar modification would occur simultaneously in them!—yet unless this happened they would be exterminated, according to the thesis quoted. (*v.* p. 22.) It would be almost impossible if variation is accidental not and ordained.

The forces of nature are equal and counteracting. Centrifugal force is counteracted by gravitation, the bane by the antidote: storms

and earthquakes are the forces of nature returning to an equilibrium after a temporary disturbance. If any one force was to predominate nature would be destroyed.

Organisms being likewise combinations of equalising and counteracting forces and matter, both collectively, and individually: if any one species attained predominance, the harmony of creation would be destroyed. Thus any advantage gained by a modification of organism, on one hand, would be counterbalanced by some corresponding disadvantage. For instance, if a birds wing became stronger its legs would be weaker, or the reverse. (*v.ch.vi.*) All increase of size is counterbalanced by a proportionate decrease in strength. M. Pateau has shown that the smallest animals are proportionately the strongest. A bee can pull thirty times proportionately more than a horse. [British Bee Jou.]

We may add, they likewise move with much more than proportionate speed.

The marvellous balance of power, through creation could not be maintained, if the "improvement of competitors," is indispensable to

prevent their extermination—and yet merely fortuitous—as we are told favourable variations may never arise. If nature left things to chance such an improved species, as the all devouring pike, would soon depopulate a river. Even a trout will devour ten thousand of its own fry in twenty four hours: but nature has provided. The voracious shark family have the disadvantage in their organism of being obliged to turn sideways when they seize prey; a remarkable example of the counterbalance principle which Mr. Darwin's hypothesis ignores.

He mentions many instances of the extermination of one species by another, in favour of his theory, they are likewise a disproof, as they show if any species dominated the balance of creation would be destroyed.

Most of the cases he quotes, have arisen by the agency of man, (*vide ante*. p. 25.) and have no analogy to what occurs independently of him, such as the "extermination of the native stingless bee in Australia by the imported bee."

Species when brought to a place where the conditions are quite different to those under

which they had lived, in some instances thrive more than in their old habitat, and dominate over native genera; because their new competitors may be less formidable, food more easily obtained, or other conditions less adverse.*

On the other hand the change is very often injurious, horses do not thrive in S. India, nor camels &c. in Ceylon.

In some cases disadvantages show themselves after a time. The coffee plant, introduced from the dry climate of Arabia, has till lately, thriven luxuriantly in the showery hill region of Ceylon, but the damp has produced a fungus (*Hemieleia devaster*) on the leaves, which now threatens to exterminate the plant.

Sometimes, numbers alone, seem to prevail.

Note to last page: when mentioning the pike we omitted to say one of its jaws project beyond the other, an arrangement somewhat similar to the mouth of a shark which gives prey a chance of escape.

* Sparrows have multiplied to such an extent in Australia, £ 50,000 has been voted in the Colony for their destruction; rabbits are nearly as bad, while the water cress and thistle have become pests in New Zealand.

There is no reason to suppose the black rat is inferior in organism to the Norway, which has driven it out of Britain: but the Norway rat, is the most prolific of rats. Although driven out Britain, the black rat is still found elsewhere. It is numerous in Ceylon, where it was imported, and this shows extermination may be only local. Waterton the naturalist is quite pathetic when he describes meeting abroad, "a poor British rat worried out of its home."

Much of Mr. Darwin's "survival" theory is founded on extermination among plants. But a struggle for existence among plants, would be more adverse than among animals, as a plant is fixed to the soil: however the coffee-plant, and other instances adduced show any advantage gained by the transfer of species to a strange locality is only temporary, the counterbalance principle in time reducing it.

No doubt every being has a severe contest for existence, not so much with competitors, as with the wearing down influences, inseparable from existence—influences, equally potent to every form of life, the mammal or animalcule.

An advance in organism does not give a better chance of survival in any respect: lowly forms have survived, all phasis of existence, while many highest species are long extinct. It is no advantage to a deer, when torn by the fangs of a lion, that it is more highly organised than an oyster.

The extinction or survival of species is, at all times, mainly a question of food; especially as there is a normal tendency in every genera to multiply beyond their means of sustenance.

Professor Liversidge says: The extinction of the gigantic marsupials of Australia is owing to the failure of the luxuriant vegetation which flourished in the Pleistocene era. [Geo. N.S. Wal's.]

One would imagine the large carnivorians would destroy all other, species in a war of extermination, but they seem to be held in check by some unknown law. Tigers for instance, are not so numerous as any of the herbivorians—yet they are more prolific than all. The lion can have no apparent difficulty in obtaining food among the vast herds of ruminants in South Africa; but the lion is comparatively scarce there. These remarks apply likewise to birds of

prey, and to most carnivorian genera, whose destructive natures are kept within certain bounds, by the same power that arrests the development of species beyond certain limits.

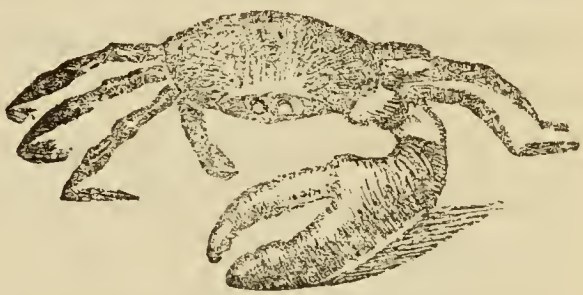
It is said some large carnivorians, when captive, at times, devour their offspring. Evidently the feline genera, with five or six at each birth, would soon outnumber the herbivorians, who seldom have more than one or two, if there was not some counteracting principle at work.*

Unless the white man appears on the scene man-eating tigers, the lion, or the eagle, can

* The Indian lion is nearly extinct, and sportsmen say tigers are getting scarce; but a recent offical Report shows they are still numerous in the Sonderbunds of the Hoogly, which has always been a favourite haunt of tigers and crocodiles. It may be argued, that numbers of tigers are killed in India for the rewards offered by the Government for their destruction. It appears however, that nearly as many natives are killed by tigers, and that in one, Presidency, more than three thousand cattle are killed by them annually. The total number of dangerous animals killed for rewards is less than the number of people and cattle they kill.

have little to dread from a war of extermination.

Dozens of species, more or less, heavily weighted in a "race for life," with what seem to be great physical disadvantages, manage to exist: such as the fly called daddy-long-legs, and the harvest-man spider (*Phalangium*). Then there is the female marsupial, whose flight is impeded by her young carried in her pouch; and the little beckoning crab (*Ocipoda*), with one claw nearly as large as its body who seems to have poor chance of escape in a race for life.



Beckoning crab.

All vertebrates pair, also all terrene species, although various lower animals are hermaphrodite and the majority of invertebrates are monœcious. Can generation by couples be a profitable modification—one giving species better chance of procreating their kind, from Darwin's point of view? According to his theory, molluscs and other self-fertilisers would have a much better chance of procreating their kind, than such as

fish, requiring the conjunction of two individuals at the spawning season, often impeded: how many male salmon, for instance, are destroyed annually before reaching the spawning ground? with the consequent loss in each case of half a million of ova.

There are many instances of multiplication by spontaneous rejuvenescence and subdivision of cells into swarm spores. Parent cells either divide into two portions, or taking a new form become a swarm spore. The change from this facile mode of multiplying, into more complex forms of generation, would be a disadvantage by checking increase.

With few exceptions, the fertility and precocity of species diminish with their developement, so that each step in organism, unless there were counterbalancing influences at work, decreases the chance of offspring reaching adolescence.

Prolific species have always shown the most vitality. In most cases species survive more by their marvellous fecundity than through all other causes.

If divers agricultural pests, and unseen ene-

mies of man, beast, and plant; such as the locust or phylloxera, were less fertile, mankind would soon exterpate their minute enemies. It is easy enough to exterpate the higher species; many are rapidly becoming extinct. The wolf is long defunct in Britain, while insect plagues are as numerous as ever. It is a common remark. "They swarm so we cannot keep them down."

Upwards of thirteen hundred tons of locusts eggs were destroyed in Cyprus, in one year!

When species multiply beyond their means of sustenance, numbers die of starvation, till the balance between numbers and food is restored, and it might be argued, that a decreased fecundity would not be an injurious variation, as it lessens the difficulty of obtaining food—here also low forms have the best chance of life: many can live for a long time without food. Snakes and spiders can fast for months.

Increased size is injurious. The smaller the species, the better its chance of escape. Many small rodents &c. have survived Pleistocene times, while all the largest animals are extinct. It is very probable that the great size of divers

extinct animals was the main cause of their disappearance; most extinct animals were larger than existing species of the same genus.

The wonderful tenacity of life exhibited by lower species must give them a better chance of survival, and a dimiuntion of this property in the higher forms is a disadvantage. Starfish and amœba if torn in pieces, each portion will grow into a perfect individual. Many insects, crabs and lobsters, can endure the loss of a limb without its producing any perceptible effect. Crocodiles have crawled back into a river after being disemboweled, and left as dead, and Mr. Yarrel gives several instances of the power possessed by fish, particularly the carp family, of enduring cold. Gold fish and the sucking earp have been found alive in a lump of ice, while Humboldt states, he saw fish thrown up alive along with boiling water, from a volcano in South America.

According to Mr. Darwin's theory the struggle for existence is so keen, the diminution of any advantage should lead to extinction, but it will be seen that undoubted advantages have been

considerably reduced,if not quite lost, as species developed,—yet they have survived the loss, showing that advantages and disadvantages, are counterbalanced in some way. Although their capacities vary, and each seems to be living only for himself—beings are so dependant on each other for existence—all must be equal in the main, and subordinate to the general good.

Extermination of Animals by Man.

The legends of Saint George and the Dragon Hercules and the Hydra, &c. are probably not so fabulous as supposed, but founded on traditional accounts of combats between primal man and extinct monsters; there being little doubt mankind have been the main cause of the disappearance of many, such as the woolly rhinosceros, the cave lion, bear, and hyena.* The *Bos longifrons* or aboriginal British ox, mastodon &c. We know that the great auk, the dodo, an aquatic bird of the duck type, in the Mauritius, the moa (*Dinornis giganteus*) of New Zealand, along

* The legend of S. George and Dragon, seems to refer to some creature of dinosaurian or pterodactyle type.

with its fellow in Madagascar, have been exterminated by the natives within the historic period. The penguin will soon meet the same fate, while the ostrich will survive—ostrich farming being a South African industry. Probably many wingless birds have been destroyed, gigantic pigeon-bones were discovered recently in Rodriguez island, and those of a goose in New Zealand.

A few years since, in many parts, a prodigious number and variety of wild animals were to be found, but when the white man appears on the scene he slays all before him. The hart-beste and zebra, the bisson and kangaroo, the seal, the elephant of Ceylon, &c. are rapidly disappearing before this destructive biped in his passion for "sport;" and he will soon destroy and devour, all except domestic kind. Half a million kangaroos and wild dogs were killed lately in Australia to make way for sheep.

If this means the "survival of the fittest," it is not the survival of the most beautiful when the georgeous pea-fowl, the golden oriole and lovely sun-birds, are exterminated, to gratify

the cruel vanity of women. Even the robin has not been spared, that they may bedeck themselves with borrowed plumes in obedience to a barbarous fashion.

NOTE

As the proposition at page 36 may not be clear, it is restated—any change from the facile mode of multiplying, common in the lowest organisms, into more complex forms of generation, with the consequent lesser chance of offspring reaching adolesence, would be a disadvantage, by checking increase—and a disproof of the "injurious variation theory."

With reference to the extinction of species through want of food; as a case in point, the rein deer (*Cervus tarandulus*) has disappeared from France and Germany along with its food, the vast moss-fields, which existed there within the historic period.

CHAPTER IV.

INDIVIDUAL ADVANTAGES.

If evolution is the slow process we are told, taking hundreds, if not thousands of years, to produce any modification of form, profitable variations, in the beginning, would be so slight, they could be of no use, in a struggle for life. Variations, would not be sufficiently developed to be of any use, for many generations, by which time the descendants of the individual in whom the variation appeared would be too numerous to profit by it.*

At page 72, Mr. Darwin says, Suppose a bird was born with a curved beak, which gave it an advantage in procuring food more easily: this bird would have a poor chance of perpetuating its kind to the exclusion of the common form.

* "The balance of evidence indicates that species in

But there can be no doubt this result would follow from the preservation during many generations, of a large number of individuals, with a more or less curved beak, and from the destruction of a still larger number of straight beaks.

It is not clear how this could happen, as it seems to be inconsistent with the first part of the proposition. If the curved beaks, procured food more easily, they would soon cause a famine among themselves, and in the struggle for existence, when "Greek met Greek, then

nature do not undergo great and abrupt changes... Natural selection generally acts with extreme slowness." Origin of Species. pp. 84 400.

A writer in the English Mechanic(Sep. 81.)mentions a case of sudden variaion, of doubtful authenticity. It is stated, that in America, within the memory of man, a buck, or several, it is not know which, was born, whose horns were straight, which gave it such an advantage,in its combats with the antlered stags, that in time their numbers diminished considerably, while the straight horned variety increased, as the offspring of the straight horned buck inherited the peculiarity. Like all cases of the kind, the advantage ceased when the straight horned bucks met in mortal strife.

would come the tug of war"—the counterbalancing disadvantage producing as much difficulty in obtaining food, as when their beaks were straight! Procuring food more easily, they would naturally eat more: what would support, say, five thousand straight beaks, would be insufficient for the same number of curved beaks, thus, a larger proportion of them would perish, all animals having a tendency to multiply beyond their means of sustenance. (*v.* p. 33.)

Mr. Darwin seems to have overlooked the circumstance that the food, and characteristics of birds with curved bills differ from those with straight bills, therefore the latter would not necessarily be destroyed, by the competition of the curved bills, whose habits would be more divergent with each generation. If natural selection has a "constant tendency to preserve offspring, most divided in structure and habit," the competition with a parent species would be very slight. (*v.* p. 27.)

No doubt many more are born, than destined to reach adolescence: a provision of nature to check extinction of species from all the ills flesh

is heir to. It is also true that an individual, born with any advantage over others of its kind, would have the best chance of leaving offspring. But this instead of leading, as Mr. Darwin argues, to the formation of new species would tend more to perpetuate types: A "beneficial variation," could only be something tending to make the individual a more vigorous, or finer specimen of its kind.(*v.* p. 25.)

What would be a profitable variation in a bird of prey, such as an eagle?—A keener eye and a swifter swoop on its victim, any thing enabling it to obtain prey more easily,—thus tending to perpetuate the bird of prey.

What would be an advantage, over others of its kind in a monkey?—A superior agility in climbing trees, which would obviously tend to perpetuate the arboreal animal.

Can the natural selection theory explain why so many more are born than can possibly reach adolescence? Fecundity cannot have been developed by a struggle for existence, or any of Mr. Darwin's factors, seeing that it is coeval with life. Nature was not likely to leave the preservation

of species to any haphazard, she has therefore endowed all her creatures with inherent prolificess, or super vitality. (*v.* ch. xx.)

At page 401 Mr. Darwin says, "Disuse is the main agent in rendering organs rudimentary, as in the case of birds inhabiting oceanic isles, which have seldom been forced by beasts of prey to take flight, and have ultimately lost the power of flying."

In this and other instances, he takes for granted, what ought to be proved. What proof is there, that the ostrich could ever fly? He "believes the ostrich is descended from the buzzard family, and the loss of wings has been compensated by increased size of body, and power of legs."

Strange he writes as though wingless birds were only found in oceanic isles! The ostrich is a native of North and South Africa! where there are many beasts of prey: and several species of wingless birds exist in Australia. If there are no predatory animals in oceanic isles, there is mankind to harry and exterminate, as in the case of the New Zealanders and moa.

The Cochin China furnishes a pro and con to Mr. Darwin's theory about oceanic birds—if its small wings are the result of disuse—Why are the wings of all other poultry, full sized and quite as little used. (*v.* ch. ix.)

If the loss of wing power, is compensated by "increased size and power of legs." This is admitting a counterbalance principle—What then becomes of the "profitable variation" theory?

No variation could be either profitable, or injurious when compensated in some way. The ostrich is quite compensated for the loss of its wings by its formidable legs, kicking vigorously in self defence. It is also very fleet and seems to have as good a chance of surviving as the eagle.

At page 82, Mr. Darwin says, "The race for life is less severe on a small island, or in fresh water basins, where we find ganoid fish, and the lepidosiren which may be called a living fossil, having endured till to day, through living in a confined area, and from less competition."

His argument seems to be. The lepidosiren has endured since Palæozoic times, therefore, the competition is less severe in confined areas!

We cannot see how this can be the cause of the endurance of type, as there are many living fossils in wide areas. The existing nautilus, differs no more from its ancestor, who floated over Silurian seas, than the lepidosiren differs from its progenitor the dipnoi of Devonian time and the Silurian star fish and Carboniferous scorpion are almost identical to extant species.

How can Mr. Darwin say, "The race for life is less severe on a small island, or in fresh water basins?" If it were so it would disturb the balance of power: unless accompanied by some corresponding disadvantage.

Frogs who live in the same locality as it, are devoured by the lepidosiren, which is rather severe competition for them. Frogs although their habitat is fresh water basins, have a sharp race for life in the tropics, being the prey of birds and snakes: mud fish, also at the perodical drying up of ponds and marshes have a bad time of it, being then exposed to various enemies, and are caught in thousands by the natives.

CHAPTER V.

NATURAL AND SEXUAL SELECTION.

At page 162 Mr. Darwin says "Natural selection cannot possibly produce any modification in a species, exclusively for the good of another species, although through nature, one species incessantly takes advantage of, and profits by the structure of others. But natural selection can, and often does, produce structure for the direct injury of others, as in the case of adders fangs. If it could be proved that any part of the structure of any one species, had been formed for the exclusive good of another species, it would annihilate my theory, for such could not have been produced by natural selection."

It is well known that, the blood of man, and the higher animals, contains a multitude of red and white corpuscules, swiming in a colourless

liquid. Now these corpuscules are modified amœba: and if not formed for the exclusive good of the being in which they exist, their development and structure are subordinate to that end, and are as much a part of an organism as any of its fibres. The red corpuscules, are more numerous and smaller than the white, which like amœba change outline, and have, in some instances, been seen under the microscope to devour the red. Although corpuscules exist through the being in whose blood they are found; they are not parasites: an animal can exist without a parasite—but it cannot exist without its corpuscule, which is an indispensable part of itself. *

Organisms, except the lowest, are not single entities, but aggregations of living particles, or entities, being formed of countless millions of cellular beings; each possessing independent

* M. M. Pasteur and Koch, have shown that living germs of disease can be modified by cultivation for the exclusive good of the being inoculated with them.

and separate vitality—yet more or less modified in structure, for the exclusive advantage of the complex organism, of which each cell is a part.

The first step in the development of species modified the simple unicellular protozoa for the exclusive good of the new species—Thus, in an organism B, composed of two or more cells; the unicellular entity A, is modified for the sole benefit of B; because, A existed without B: but B could not be developed without A, which retains its original cellular individuality, although changed in form, and joined to B.

Every change in species, is really a modification of cellular entities, for the exclusive advantage of new species.

Every being is more or less, dependant on other creatures for existence. Flies do not, probably, exist exclusively for spiders, but spiders would be extinct if there were no flies, and spiders are indirectly doing good to others by destroying flies. Throughout nature species are performing acts benefiting others although each seems to be living only for itself.

Many instances of this might be quoted, such as the birds in Paraguay, who prey on flies that kill cattle; and cattle in India also derive great benefit from crows and shrikes, who pick ticks off their backs.

Mr. Darwin says his theory, "includes the dependance of one species on another," which is inconsistent with a universal war of extermination." Dependance on each other includes more or less structural dependance, remarkably exhibited in the mutual dependance of insects and plants. Many plants could not be fertilised without bees. The cowslip and primrose exist under two forms, differing in the stamens and pistils: This he has shown is a wonderful provision, enabling insects to fertilise the flowers of one kind with pollen from the other.

If neither the plant or insect were so formed for the exclusive good of either, the reciprocal benefit is almost equivalent to it.

Many organisms are modified for the exclusive good of offspring, such as the blindness of young carnivorians. The female cocus, dies immediately after depositing her eggs, and her

body is transformed into a cover protecting the young during winter.

Domestic animals have been considerably modified in structure for the exclusive good of mankind: no one would say the transformation of the Bos primigenius, into a prize ox could be of any possible benefit to the animal.

Those cases of structure for the direct injury of others, such as the fangs of an adder, are accompanied however, by the counterbalancing dislike to bite, generally exhibited by thanatophidæ, or death snakes: Non venomous species being as prone to bite, as most weak animals to show their powers of self defence.

Mr. Darwin says the rattle of the rattlesnake is designed to frighten birds, who prey on snakes, but if so, why have not all snakes got a rattle? which is said to be the noise made by the old skin collecting in wrinkles, before it is shed, a peculiarity in this snake.

Sexual Selection.

What is the difference between natural, and sexual selection?—not much in reality. Only sexual selection modifies creatures, chiefly in the

ornamental line; that is, if some of the alleged effects can be considered ornamental, such as a remarkable redundancy of fat distinguishing Hottentot women. Mr. Darwin says they are steatophygous, which has been developed by sexual selection. But will it explain why some species of sheep, such as the Tartary and Cape, have a similar tendency to deposit enormous quantities of fat about their hind quarters.

Some of the results of these two factors are rather contradictory. Natural selection gave primal man a coat of hair, as a protection from the elements, and sexual selection afterwards removed it for ornamental purposes !

Domestic animals do not seem to be influenced by the motives attributed to wild species, by Mr. Darwin, who says " Feathers of lively hue, and other conspicuous adornments of males, have been gradually developed, through females preferring the gayest mates."—But if it has produced gay colour in some, why not all? As there can be no effect without a cause, admitting birds have a perception of colour—how could the hen bird acquire a love for bright hues

if her mate was not originally, more gaily feathered than herself?

Mr. Wallace thinks, the brilliant plumage of some male birds, is owing to the superior vitality and energy of the male sex; which is very probable. The breast of a robin is more red in spring, and the gular sack of some lizards becomes tri-coloured at the pairing season.

A tropical sun seems to develope bright tints: Geof. St. Hillaire has remarked, that bats are highly coloured near the equator, the "painted" varieties acquiring rich orange and red hues.

Can the sexual theory, account for the lovely colours of many shells, and tropical snails? to say nothing about other monœcious species.

Mr. Darwin says. "Flowers have brilliant hues so that insects may see them! But is it not more probable, they are attracted to them by the perfume and honey? The flower buds of the Palmyra and coco nut palms although, they are PALE GREEN, when tapped for the saccharine liquid called toddy, attract swarms of insects.

Sir. J. Lubbock's experiments seem to show that bees have a fancy for blue; and colours

seem to present a different appearance to ants, from what they do to us.

It has been ascertained that the lower crustaceans have no sense of colour; colours appear to them, only as variations or degrees of light: and it is doubtful, animals have any perception of colour similar to ours. Mr. Darwin's sexual theory is founded on the assumption that they have, which ought to be proved first. Colour blindness is not uncommon in mankind.

When the Western-world was discovered by Colombus, he found that some of the natives flattened the heads of their infants, as a mark of beauty. It may be inferred they had practiced the fashion from a very remote period,—why did it not develope a race, born with flat heads? —if other very similar hereditary peculiarities have originated in sexual fancies. Then there is the instance of the feet of Chinese women &c.

CHAPTER VI.

USE AND DISUSE.

MR. DARWIN is very contradictory in this part of his theory. If the ostrich has lost the power of flight, through disuse of its wings—why have tame geese and ducks, retained their web feet, when often, successive generations never swim? He puts similar queries himself, and answers "Every peculiarity when once acquired is long inherited." (p. 414.)

But why should not this theory be applied in all cases? "The leg bones of tame ducks, he says, are heaver, and their wing bones lighter, than those of wild birds, because they fly less and walk more." On the same principle their web feet should change because they swim less!

At page 37, he says. "The King Charles spaniel differs from what it was, having been

unconsciously modified." At this rate, considering that the goose has been domesticated for six thousand years: not only the feet, but the whole bird should have been "unconsciously" modified long ago.

It is well known, certain handicrafts cause certain physical peculiarities among workmen, as in the case of the "brawny blacksmith," and according to the theory of use and disuse; if the same trade was followed by successive generations, it would develope the peculiarities, and make them hereditary.

In India, where the same trade has been followed by father and son, time immemorial, we find the hereditary smith, palm tree-climber &c.—Is the modern Hindu blacksmith more brawny than his ancestor?—Has the palm tree climber developed into a semi-arboreal creature? Certainly not. Yet the converse theory is used by Lamarck to show how apes could have developed into mankind! (*v.* p. 6.)

It is remarkable that hereditary handicraftship has not produced hereditary deviations of

form, physical peculiarities, indicative of their trade, especially in palm tree-climbers, the constant stretching of the arms round the trunks of the trees should have produced elongation of these limbs; and it shows "use and disuse" are very dubious factors in the development of species.

Mr. Darwin adduces, the great and "inherent increase in the size of cows udders: but the increase is not inherent; if domestic cattle were allowed to run wild, after a time, the udders would return to their original size, as will be seen in the Chillingham herd. (*v.* ch. ix.)

CHAPTER VII.

CHANGING CONDITIONS.

At page 106 Mr. Darwin says "There are two factors in variation, the nature of the organism, which is the most important of the two, and the nature of the conditions. Instances are known where species keep true under most opposite climates: widely different conditions produce like variations in the same species; which inclines me to lay most weight on a tendency to vary, due to causes of which we are quite ignorant."

Bears are found in the polar regions, and in the tropics. All the pachydermata are tropical, except the pig, which has a wide geographical range. Orangs and gorillas are exclusively tropical, while man is ubiquitous. Among Cetacea, seals and walrus are polar, while dugongs are quite tropical. Mr. Wallace remarks, "lizards

although tropical, go further north than snakes, and are found in the Alps at ten thousand feet.

In many instances climate seems to produce much peculiarity, both in plants and animals. The purple blossomed thorn apple of India, *Datura stramonium*, has white flowers in Ceylon: in the hill region, annuals such as the peach, become evergreens, and cease to ripen or yield fruit, while on the other hand, the climate has no effect on similar exotics.

The flora and fauna of Ceylon, are good instances of the difficulty of accounting for variation through the nature of the conditions. A large portion of the beetles and spiders are European. *Bembidiidæ* are as common as in N. regions, and most numerous in the *hottest* parts of the island; and it may be argued from these facts, that variation proceeds mostly from some inherent difference in the nature of species, of which, as Mr. Darwin admitts we are ignorant.

Many species naturalize with facility every where, and the changed conditions have little effect on them, while others, will only naturalize in some localities.

Southern India is inimical to the horse, who thrives in Australia: Cockroaches and the fish insect(*Lepisma*)both from the West Indies, have found a suitable home in Europe.[*v. ante* p. 10,31.]

This brings us to hybernation: animals such as bats, lead quite a different life in the tropics from what they do in Europe, where they hybernate during winter, although, bats every where exhibit the peculiarity, of males and females never being seen in the same locality at different times of the year.

Why were not hybernating species gradually adapted for active life, during winter, like most species?—or why do they not migrate?

Instead of which a hybernating animal; when winter sets in, goes to sleep till summer returns, and thus instinctively escapes death from want of food. Dr. J. Hunter the celebrated surgeon, remarked, that hybernation is not solely the result of cold, but proceeds mainly from food being cut off by frost. Yet some species lay up a store of food, although dormant during winter, as in the case of bees.

How did animals acquire the instinct of hy-

bernation? The Ceylon pond tortoisè (*Emyda Ceylonicus*)hybernates when brought to Europe, also the fish insect, but the cockroach does not.

Here we have the same conditions producing dissimilar results quite suddenly! which is utterly opposed to Mr. Darwin's theories.

The African mud-fish, lepidosiren, has lungs: yet several species of fish without lungs, exist during the dry season of tropical climates in the muddy bottom of pools: the climbing perch of Southern India, can exist in mud so thick, it could not pass through its gills, by rising at times, to the surface for air; and it has been proved that this very curious species, and some other genera of mud-fish die in a few hours when deprived of air. [*v. ante.* p. 48. J. Cey. R. A. S. 1865.]

All this shows similar conditions of existence have developed different organisms. Some class the lepidosiren as a reptile, and some say it is a fish its gills being covered by opercula.

Several inexplicable anomalies occur among fish, and aquatic reptiles: mackerel and flat-fish have no air bladder, and that of perch is closed. The Proteus of Carniola has lungs, but

although it often rises for air; it never enters its lungs, being expelled by the branchial apertures.

Sir J. Lubbock deduces from the calculations of Croll, on the excentricity of the earths orbit, that there have been alternate tropical and glacial periods(each lasting about ten thousand years) in both hemispheres. The last glacial period in the north pole, having begun about three hundred thousand years since." There is no doubt of the former existence in Europe of hippopotamus, rhinosceros, and elephants—and if altered conditions are a factor: why is it not now inhabited by modified elephants &c? Instead of which the animals characteristic of warm climates who existed in Europe during the last tropical era, must have migrated or were exterminated by the glacial cold. We also find the animals natural to cold regions, who lived in glacial times, are extinct, or have migrated to artic regions. The woolly rhinoceros and mammoth are extinct, but ovi polis are yet found in polar latitudes.

If we turn to the Southern pole: Australia

must likewise have had great climatic changes; the most northern point being only thirteen degrees within the tropics: but as in Europe, we find extinction to a great extent, instead of modification to suit altered conditions of life. Thylacoleo, a marsupial lion, and other genera have vanished, and no kindred species exist. [*v.* p. 33.]

The narrow straits of Macassar and Lombok separate widely different zoologies. There are no tigers, pards, elephants, rhinosceros, or apes in Australia, or adjoining regions. The fauna of Australia differs not only, from that north of Lombok straits, but from all other parts of the world. There are more mammals in proportion to other species, and mostly marsupials. And many birds with peculiar habits, hatching their eggs in heaps of dead leaves.

Mr. Darwin seems to have had this problem in his mind, when he wrote. "Although two countries may have similar physical conditions ...we need feel no surprise at the inhabitants being widely different, if they have been a long time sundered."

But it is only part of the Australian fauna that

differs so much: his theory will not account for the coexistence, with the marsupials, of many members of the Asian fauna, such as wild dogs bats, flying-foxes, dugongs, crocodiles, snakes, tree-frogs, &c. This has been the case from a remote period; fossil crocodiles are wide spread in the tertiary deposits of Australia, and fossil seals occur along with kangaroos and wombats in the lime stone caves, Wellinton S. Australia, Lat. 35°S. Some of the Asian fauna might have passed Lombok straits, but many could not.

Relics of marsupials have been found in England, in pre-tertiary deposits; which seems to prove they were at a time universal.

According to the new school of geology: since life appeared on our planet, its physical revolutions have been almost imperceptibly produced; differing neither in kind, or degree, from what we see at the present day: the changes in the conditions would, thus, be insufficient to account for the great difference between some of its ancient and modern inhabitants—especially as the oldest fossils are very similar to many extant species. The lepidosiren shows that the life

of a mud-fish in the Devon period, was nearly the same as at present.

It is now supposed that the great Laurentian strata of Canada were originally ordinary beds of sand stone, shale and lime: and there is no reason to believe the seas of that period were different from the present.

Many rocks, formerly supposed of marine origin, such as Cis-Himalayan palæzoic rocks, have been deposited in vast fresh-water lakes: old red sandstone, is believed to be a fresh-water deposit, distinct from the contemporary marine Devonian rocks: fossil fish of old red sandstone present a close analogy to the Polypterus of African rivers, and Cèradotus of Australia.*

B. Savarin the great gastronomist remarks in his "Physiologie du gout," that "fish are truly antediluvian creatures surviving the mighty cataclysm, which drowned our ancestors in the eighteenth century of the world; to them a time

* Nicholson Palæ. p. 511. Hicks Geo. Mag. 1876.
Dana Proced. American Geolo. Assoc. 1874.
Dr. Ramsey Address Brit. Assoc. 1880.

of joy and festivity." There is a great deal of truth in this quaint idea, fish could survive a geological convulsion that would destroy all terrene species.

Buffon in his "Epoques de la nature," argues that the cooling of the globe having been a gradual process, animals and plants, first appeared in northern regions, the only part in primal times, cool enough, for life to exist.

Mr. C. Ranyard about five years since sent a memoir to the Astronomical Society, on "Meteoric Dust," suggesting that it may account for the preponderance of land over water, in the northern hemisphere, and the tapering of all the great peninsulas southwards."

It seems more probable, that the great tidal wave which commences in the southern hemisphere, and flows northward, has given the peninsulas their tapering form and carried their debris northward. The influence of the moon would have been much greater formerly, if as some suppose, it was nearer than at present.

CHAPTER VIII.

SEPARATE CREATIONS AND LINEAR DESCENT

It has been pointed out in Chapter I, that from the commencement of life, "natural selection," has only worked within certain lines—showing a remarkable, structural subordination, in each member of an order, to its archetype, which proves natural selection is not an independent power. At first sight the evolution theory leads to the inference, that there has been a regular linear succession of beings, from the commencement of life: but it cannot be shown that the animal world, is the result of linear evolution from a single primal form.*

We can only trace a linear succession in all vertebrates, or in all crustacea: as the members

* Sir. J. Lubbock says "Whether fish and insect, reptile, birds and beast, are derived from one original stock or not; they are certainly not links, in one sequence."

of each order, only differ from each other in a modification of their distinctive type.

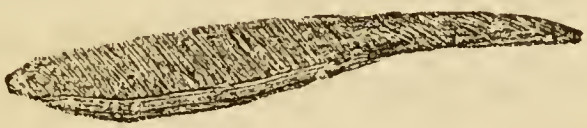
This unity of type shows, that the development of members in each order, is partly arrested, that is, although variation and modification of form goes on, the type is maintained: variation being subordinate to that end. If we reject the idea that the archetypes are separate creations, marking out the lines, within which, nature was to mould the animal world,—How has the balance between the opposing principles of variation and unity of type been maintained? Without some restraining principle an inherent tendency to vary would lead in time, to change of type.

With only one progenitor unity, or fixity of type seems impossible; as in that case annuloida must have developed into articulata: Articulata into mollusca &c. [*v. ante* p. 8.]

Each order commences with a lower organism, than that of the most developed member of the class next below it, which is quite at variance with the idea of a single progenitor, or else its offspring branched off at the dawn of life on

very different and fixed lines. The lancelet, the lowest vertebrate, is a very low type of animal, while Cephalopoda, the most developed of the molluscs, such as nautilus and octopus, have a high and so singular an organism, some think they are a distinct order.

An attempt has been made to find a more primal vertebrate progenitor than the lancelet, among Ascidians.



The Lancelet (*Amphioxus.*)

Although insects are classed with crustacea, under the general term of Articulata, including all creatures whose bodies are formed of rings or segments: they seem to be a distinct creation, commencing with a high organism. Sir. J. Lubbock says, "Insects cannot have passed through all the lower forms of life; and naturalists do not agree as to the actual line of their descent: and can only assume, they have been developed from simpler organisms." [On Insects p. 84.]

The wings alone, mark winged insects, as a

distinct creation. No where can we find the insect wing in a rudimentary state: and it is always formed on the same plan. The wings of some mantidæ, such as Phyllium siccifolium, resemble in texture and outline real leaves; this is the only exception, all other mantidæ have the true transparent wing, although in Mantis religiosa, the ambulatory tribe, it is small, and never used, resembling in both respects, those of the allied cockroaches and some beetles.

It may be argued that all small, or shriveled wings, are rudimentary: but according to Mr. Darwin, that is a proof they were originally in a fully developed state. At page 148 he quotes Landois who says "The wings of insects have been developed from the tracheœ or gullet!" Sir. J. Lubbock remarks: "how they developed has not been explained. Some say they were respiratory or swiming organs. Polynema natans, uses its wings for swiming. A folia expansion on the sides of Chlaieon larva, is pointed out as a probable embryo wing."

Mr. Scudder says, The general type of insect wing structure; has remained unaltered from

the earliest times."[Boston Nat. His. Mem. 1879] Bees and moths existed in the Devon period.

Primal and Animalcular Forms

Is it quite certain, what are called the lowest forms of life are the "primal," or those which first appeared? There may have been a descending, as well as an ascending scale in life.

Mr. Darwin puts the question: what is advance in organism?" A very intricate subject, he says, that has not been defined to the satisfaction of naturalists. There are parasite crustaceans, whose mature organism is less perfect, in some parts than its larva."

M. Agassiz says: "On embryonic grounds Echini were probably, the first creation: Echini in the early stages of developement, resemble the first Echinods in the geological sequence."

But then comes the question of infancy, and parentage: existing species pass through infantile stages; and if Echini were the primal form, the first of them could have had no infancy; but must have assumed, or been created in, an adult state at once.

The infancy of species is an argument in fa-

vour of evolution—when the young are dependant on their parents in the infantile stages of life,such species must be either developed from anterior forms, or were originally created in an adult state. The lowest forms who increase by subdivision have no infancy, strictly speaking; although we are told "the most microscopic of beings has a progenitor in some pre-existing organism." If so, the primal form was probably some Bacillus, beyond the power of the microscope to reveal, as experiments show the existence of invisible germs of life in the air. being a distinct aërial creation: M.M.Miquel and Pasteur have shown that the spores of aërial Bacilli are not engendered by damp or the product of water.

Mr. Darwin's primal form seems to be something more highly developed than a Bacillus—certainly, his progenitors were, and he seems to admit they were created so.[*v. ante* p. 6.]

Sir.J.Lubbock says, "Hæckels Protoamœba primitiva, a homgenous structurless substance is very like his primal ancestor,...which in spite of its antiquity still exists unaltered."(p.98.)

Of its antiquity there is no proof: such protozoa are eliminated from Palæontological lists, as no trace of their past existence is possible, from their soft bodies.

Amœba are the most singular of the animalcules, constantly changing their entire shape by throwing out finger like projections.

Amœba diffluens.

A single cell forming the first step in life, all unicellular beings may be considered separate creations: Mostly so near the boundary which separates living from lifeless matter, it would be difficult to prove they are links in any sequence.

A single drop of sewer water contains a number and variety of microscopic animalcules,such as Rotifer Oxtryicha &c.—How could these creatures, who spring into coeval existence, and whose forms are very different, be developed in linear succession?—On Mr. Darwin's theory of slow modfication, it would take centuries to transform them.

Many parasites come into existence through the higher animals,—for instance, few would

say bird lice existed before the birds on which they prey—How therefore do they occur? In common with animalcules engendered in decaying substances, such as mites in cheese, and sugar, they spring into existence more highly organised than is compatible with gradual development. If they have been derived from anterior forms, where are we to find the ancestor of the sugar, or cheese mite ?(*Acarus domesticus*) and Acarus of the itch(*Scarcoptes scabiei*)found on mankind Linguatulidæ may be pointed out whose young in the egg resemble Acari, and have four jointed legs; but in the mature form the characteristics are lost through degradation, and it is doubtful they are early acari. They are worm like, and found in the heads of mammals especially deer.

Some parasites, such as liver fluke, *Fasciola hepatica*, may be derived from anterior species, as it partly leads a separate existence,and passes through several transformations before it enters the animal on which it preys—but it cannot attain its full developement till then.

Considering the variety of animalcules who

spring, more or less developed, into coeval and apparently primal existence, for we know nothing of their having had anterior forms: it seems absurd to write about species being derived from, one primal form, unless it can be proved there is a unique aërial germ, beyond the ken of the microscope, that generates very different organisms according to the nature of the substance, or animal, on which it acts.

In addition to the old host of animalcules many new are being revealed through increased research. Malaria and the splenic apoplexy of cattle are caused by rod shaped parasites(*Bacillus anthracis*)in the blood. Typhod fever in pigs, and tubercular disease, are also owing to Bacilli.

According to Dr. A. Carpenter, many "protoplasims" are natures scavengers, living on unwholesome matter: and always seeking an entrance where it exists; thus become associated with disease in man and beast, if not the actual germs.

[v. Address Croydon San. Congres, 79. Proce. Ray Soc. ,78. Zoo. Record Protozoa. Hæckel Der Moneren. Quar. Jour. Micro. Soc. Koch Phy. Soc. Berlin 1882.]

CHAPTER IX.

DOMESTICATION OF ANIMALS.

Mr. Darwin's hypothesis is mainly founded on the changes produced by domestication,—He argues, "If organic beings had not an inherent tendency to vary, man could have done nothing; he does not originate variation." (*v. ante* p. 10.)

It does not follow because a few spècies have been changed by domestication that all beings have a tendency to vary. A vast majority of extant species being still in a wild state, those who have been domesticated are not numerous enough to judge by. Many will neither live long, or breed in captivity; and many such as tigers are too savage to permit of domestication. Only two insects, bees and the silk-moth, have been domesticated, out of many thousands, and they have remained unaltered time immemorial.

About twelve genera of mammals, and the

same number of birds have been domesticated: carp, such as gold fish, are the only genera of fish that can be considered domesticated, out of nine thousand species, although fish-culture has been practiced from a remote period. The Romans are said to have fed the yellow spotted Muræna with their slaves.

The total of existing genera is about 5,000, giving 64 species to a genera, of which only twenty seven have been domesticated.

Variation among domestic spècies is comparatively recent. The British sheep in the middle of the last century, was almost aboriginal when Bakewell produced his Leicestershire type, or Dishley breed; and it is chiefly since then, stock breeders in England have effected so much.

In many countries domestic animals have not varied within the memory of man. The camel of to day, appears to be the same creature, it was in the days of ABRAHAM: and the broad tailed sheep of Africa have not altered since the days of Herodotus.[l. iii. 113.]

The camel occupies a similar position in the animal world, to that of the coco-nut palm in

the flora, neither being found any where unassociated with man. D'Orbigny in his "Dictionaire Naturel" says, There are no wild camels, the few apparently wild, found in some parts of Tartary, being descended from tame animals let loose. Some skins, said to be those of wild camels, have been lately obtained in the higher ranges of Kashgar, by Prejevalsky a Russian explorer. [Meet. Geo. Soc. 1878.]

Judging from the works of Varo and Columella the Romans paid much attention to stock breeding. The asses and mules of Rheti are still famous. The modern dun coloured cattle of Tuscany are said to be a cross between the pure black breed of the Romans and the white cattle who accompanied the Huns and Vandals. Pliny also writes of prize pigeons, that people could reckon their pedigrees.

There is a great difference between the conditions of tame and wild existence. A profitable variation in the eyes of a breeder, who wants only a huge mass of flesh, or a lump of fat, would be little use to a wild animal in a race for life: (*v.* pp. 17 18.)which shows the variation produced

through domestication is not a reliable guide; and nature seems to be always counteracting the effects of domestication. Nature meant her creatures to be one shape and man is trying to turn them into another: which may account for the difficulties of breeders. Organisms being combinations of equalising forces, or entities, always at work to maintain an eqilibrium, any variation in one part, however it may occur, is sure to produce some counterbalancing effect in another place. (*v.* pp. 17 29 50 57.)

Why are not the forms produced by breeders so true, or so permanent, as wild species?

Every farmer is sure, the fox who carries off his poultry, will have cubs just like itself: but he never knows what colour, or form many of his young stock will have.

Mr. Darwin says, "The wing bones of tame ducks are not so heavy as those of wild ducks" —very likely: but the tame ducks let loose on the Serpentine, in time, fly like wild birds, recovering the use of their wings with liberty.

As with natural selection, breeders can only work within fixed lines: although a prize Devon

is a very different animal from the Celtic cattle of our ancestors, yet it is an ox. Neither is a prize Dorset pig, much like a gaunt Luthanian, or a wild boar, but it is a true pig; and notwithstanding all Mr. Darwin has written about the variation produced in pigeons by fanciers, they are still true pigeons.

Nature has made the lines, separating species impassable by stamping all mule offspring with sterility. Closely allied species although living in close vicinity, never consort: sparrows never consort with other finches, nor one kind of ape with another.

Mankind are a remarkable exception to this law. The horse and ass do not differ more, than some races of men differ: yet the offspring of the first, are sterile; while no variety of half-cast is.

Note to page 78, we believe quadrumana are never born in captivity.

A Persian historian writing of an elephant that was born in Persia, says "Never till then had an elephant borne young in Irán, no more than a lion in Rum, a tabby cat in China, or a mare in India." [Elliot i 69.]

CHAPTER X.

TRANSITIONAL FORMS.

Mr. Darwin accounts for the absence of the fossils of transitional forms—which he admits is a serious objection to his theory—by the supposition, that they have been exterminated in the process of the formation of the perfect forms. [p. 346] Then he says, "Although many links exist between extant and former species, we do not find infinitely numerous, and fine transitional forms closely joining all together."

If animals are descended from several distinct progenitors, there never could have been any links joining them together, at least, which he seems to have overlooked. (*v. ante* pp. 6 70.)

Many extant species, called links, are not true links. If a flying mammal, such as a bat, which is termed a link between a bird and mouse; were a real link between birds and mammals, it would have some characteristics of both. But wing-

handed animals are all true mammals, with no characteristics of birds. The bones of bats are slender, but not aërated like some birds. Most of them have no real resemblance to a mouse; the horse-shoe-nose, and leaflet varieties presenting a unique appearance.

The flying lemur (*Galeopithicus volans*) is said to be a link between four, and wing-handed mammals, but the connection is fanciful. The flying apparatus being only a membrane along the side connecting the fore and hind legs like a flying squirrel.

The Ornithorhynchus, or duck mole of Australia, called a link between birds and mammals, is a small hairy quadruped, with a mouth like the bill of a duck, and its hind feet are webbed. It is a question whether it is not an anomaly, or an instance of repetition. It is not the only webfooted quadruped, the water shrew (*Galemys pyrenica*) has webfeet, also a species of toad, and a tree frog, and there is a turtle with a mouth like a hawks bill.

The free claws of the dodo is a similar case to the web foot of the duck mole, which is not

like the foot of any species of bird, having five toes like the Surinam toad. The duck mole however has some internal organs like a birds.

Mr. Darwin in his Descent of man, says "Quadrupeds, and the higher mammals are descended from some marsupial animal," ignoring the existence of the duck mole, which is the lowest form of mammal, although its young are more developed, than those of marsupials.

Although the duck mole has no pouch, it appears in a rudimentary state in the porcupine ant eater, the other Monotremata: while on Mr. Darwin's theory it should be full sized—unless, the porcupine ant eater, duck mole, and kangaroo, are descended on different lines from a progenitor with a fully developed pouch.

CHAPTER XI.

HAS EVOLUTION CEASED.

It is difficult to see why a process, apparently, for a long time so active, should to all appearance have come to an end. The permanence of existing types would prove this. With regard to mankind, the monuments of Egypt show that the white man, and negro were as distinct, thousands of years ago, as they are to day. Some Philolgists say that the terms Japhet and Aryan, refer to the white man,as certainly as Ham does to the black: while the Cuneform inscriptions show, Shem is equivalent to yellow or brown: so that at least five thousand years since, the three chief races of men were already in existence.

Fossil evidence shows there are fewer species now extant than at some former geological eras. Whatever evolution may have done formerly, "Extinction and natural selection do not go hand in hand" at present.—Where are the new

forms, Mr. Darwin says are being "slowly and continuously produced"?

What new species may we expect to see any where? Perhaps we may find some cetacean developing into something very like a whale! Perhaps the phylloxera and Colorado beetle are new species. The phylloxera holds its own, in a struggle with the vine grower, and is evidently a "favoured variety."

Fish have been so thinned by man, there is plenty of room in the ocean: the old genera are disappearing, and there are none to replace them although the conditions, are seemingly favourable to the development of new forms.

Some "new species" described in the "Voyage of the Challenger," are only old forms that had escaped previous observation.

Even with domestic animals, as Mr. Wallace says, there is a limit to be reached in breeding. There is a limit to the fleetness of horses.

It is among amphibia, one would most expect to find some change of organism. Does the crocodile which is found in a fossil state, depicted on Egyptian monuments, and embalmed

as a mummy, differ from the extant species?

Frogs also, seem to be much the same sort of creatures they were when Moses brought them out of the rivers and ponds into Pharohs house. (Exod. viii.)

Many birds, and other species, who are not true amphibia, such as webfooted fowl, otters, and beavers, live habitually in two elements, yet they never incline more towards one than the other. This is still more remarkable in the case of migratory species, who pass from one hemisphere to another. The great family of waterfowl who spend one season, on the cold waters of artic regions, and the next on the tepid tanks of the tropics, still preserve all their characteristics.

The swallow who alternately builds its nest under the eaves of a modern London villa, and a Grecian temple, is the same bird, as when Anacreon wrote the lines—

> "Silly swallow! prating thing,
> Shall I clip that wheeling wing!"—Ode x.

Many quotations might be given from ancient authors proving, how species have maintained distinctive peculiarities. The descriptions of

Aristotle, the most ancient of naturalists, would be quite true now. Strabo quoting Megasthenes, (xv.i.37.)mentions the long tailed(κερκοπιθηκους) and white monkeys of India, which he accurately describes as having black faces(εἶναι μελαν)and being as large as dogs, μεγιστον Κονων.

Fossil evidence also furnishes a long list of species, which have not changed during some hundred thousand years. The organ grinders monkey, and the species called Semnopithecus, are not distinguishable from their fossil ancestors, who gambolled in the miocene jungles of India, and cracked their nuts in the pliocene forests of Essex.

Fossils of the true horse have been found in British pliocene beds, and in S. America, where it was extinct when the Spaniards arrived. It is called the true horse because, an extinct species, the "Hipparion," with two little hoofs hanging from the ends of the splinter bones, has been found in German miocene deposits.

The rein deer, red deer, and little roe buck, roamed through the Post pliocene wilds of Europe: and Professor Owen says, the wolves,

foxes, badgers, cats, weasels, moles, and shrews; the hare, rabbit, and other rodents of pliocene Europe, are not distinguishable from existing species: the Sus fossilis a contemporary of the mammoth, is identical with the wild pig of our time. The aboriginal British ox(*Bos longifrons*) of small stature and short horned, the probable source of the domestic cattle of the Celts, and extant till the XII century; was a contemporary of the giant Bos primiginius of pliocene marls.

The Bos moschatus, or musk ox, which some think a species, of Ovi polis, or polar sheep, is still found in artic regions. A herd of nine were shot by the British expedition in 1875.

Admitting, many species have not altered within the memory of man, Mr. Darwin says "modifications of structure are so slow, it takes vast periods to accomplish them." Although he quotes Pliny to show that pears in his day, were inferior to ours; and says the King Charles spaniel differs from what it was.

Bakewell produced his breed of sheep during his own life time; and two-year-old beef, and

fourteen months mutton, are now common.

If such modifications can be produced so soon—why should it take thousands of years to effect similar changes in wild species?—especially, where the theory is founded on the changes produced by breeders.

High bred animals however are more precocious than low bred, or wild species, although low organisms are more precocious, and change less than the higher. Bacilli come to maturity in a few hours, an elephant takes thirty years.

Marine species are still more enduring than terrene(*v.* p. 48.)and probably live longer. A carp nearly four centuries old died recently in the lake of Fontainbleau.

A curious instance of the unalertabilty of species is noticed by Pliny.(ix.46.) The little house lizard, or geckoe, of warm climates drops part of its tail when it falls, or is hotly pursued.

Now why should a new piece of tail grow in place of the dismembered part, which is always the case in a few weeks—unless to prove its unalterable nature. The animal is none the worse for the dismemberment, making off with great

speed, while its tail remains wriggling on the ground. Mr. Darwin's probable answer to this query has been discussed in Chapter VII.

It is shown at page 63 that similar conditions of existence have developed different organs. On the other hand although similar species live under dissimilar conditions they retain the chief characteristics of their order. There are tree, burrowing, water, ground, and flying lizards—snakes, mammals &c. The habits of life of many animals, are quite different from those of most of their kind. Although frogs are amphibious species, some live in trees !—why do they retain a Batrachian form, so unsuited for arboreal life? Birds are mainly adapted for locomotion in the air: yet some,such as coots live chiefly in water !

How came the newt which never leaves the water, to have the limbs especially adapted for terrene locomotion?

CHAPTER XII

METAMORPHOSIS.

THERE is nothing in creation more extraordinary than the metamorphosis of insects, which Sir J. Lubbock thinks the greatest difficulty in the way of accepting Mr. Darwin's theory. "No one as far as he knows has attempted to explain it in accordance with his theory." The transformation of a crawling caterpillar into the—

> "Queen of Eastern spring,
> Rising on her purple wing."
>
> Byron.

Is indeed marvellous. Mr. Darwin says little about the metamorphosis of insects, which he connects with embryology, and attributes to adaption. "Most of the best authors, he remarks, think the changes of insects have been acquired through adaption, and not through inheritance from some ancestral form." (p. 394.) He seems to imply that insects are formed on a different

principle from other species! Is adaption some thing different from natural selection? If the changes were not inherited how were they transmitted?

Then he says, "The metamorphosis of insects are generally effected abruptly by a few stages, but the transformations are really numerous and gradual. The insect called Chlœen undergoes twenty changes. Here we see metamorphosis in a primary and gradual manner."

We conclude he means that metamorphosis, like embryology, is an abreviation of development, wings and other limbs, it is said, do not appear in the early embryonic stages of any genera. Yet there is an essential difference. In one case, the development of the embryo is arrested at an intermediate stage, by an independent larva existence under a different form.

Embryos who attain their chief characteristics or resemble the parent, before leaving the egg, are gradually and consecutively developed in a dormant state.

Larvæ acquire adult characteristics after lea-

ving the egg, and have the attributes of mature forms. The larva, pupa and imago of the may fly, do not differ much. Embryo existence, in reality, ceases on exit from the egg: metamorphosis after that, seems to be what Mr. Darwin calls "Variation after early youth."

Although some pupæ lead an active life, this stage, is generally a death like state which no external influence could effect; yet they undergo entire change. The transformation goes on all the same, as with those who are active.

External conditions would be more likely to effect the larvæ, who have a very severe struggle for existence. So severe not one in fifty reaches the pupa state. Yet they produce no effect on the final form.

Admitting the same extermination of transitional forms has occurred with insects, as with other species, such as the development of reptiles into birds. (*v.* p. 83) Reptiles do not change abruptly into birds although they differ less than some larva and imago differ.

In the case of the tadpole, inherent nature sets at defiance Mr. Darwin's theory. Tadpoles

live in water, breathing water like fish, through branchial organs, which disappear after three months, when lungs are developed forcing the animal to partly abandon its natal element! It is the same with many insects who pass their early life in water.

Some larvæ are multiparous. There is a small green caterpillar from whose sides issue a number of pupæ, who spin yellow silky cocoons each developing into a fly.

Another Phenomenon are the Oiketicus moths. The female ultimately becoming a vermicule, its legs and wings dropping off. The female of the coffee tree bug (*Lecanium coffeæ*) also differs in several respects from the male, and has no wings. There are several similar instances of abrupt retrogression. The wings of black, and white ants drop off a few hours after swarming, although Mr. Darwin says organs only become superflous, or rudimentary very gradually, adducing the shriveled wings of cock roaches and beetles as a proof of his theory.

The larva of many beetles and butterflies do

not differ much. Yet what a difference in the imago!

In metamorphosis different means are often employed to arrive at the same end, which can only proceed from inherent causes. The pupa is usually enclosed in a cocoon, but there is a great difference in its composition. A mantidæ cocoon is made of pith, an Oiketicus makes a cover with little bits of stick, lined with silk, and boring beetles form one of gnawed wood cemented with a secretion. Most butterfles are enclosed in a horny case, while night moths, including Bombycidæ, the true silk moths, spin a more or less silky cover.

It is well known that catterpillars live on the leaves of particular plants. The Tusseh silk worm(*Phalæna rincini*)lives on the castor oil tree, and bo tree(*Ficus religiosa*). The true silkworm dies if it cannot obtain mulberry leaves, although it has been domesticated several thousand years: yet several tame animals have been adapted to quite a different diet from their natural one.

Steenstrup and others have pointed out, that

"alternation of generation" of type and brood, differing in structure and habits, occurs in many species; a phenomenon which cannot be accounted for by any theory. In some genera of Cynips, or gall fly, there are no males, while others are double brooded. The insect termed Neuroterus lenticularis, are all females: they produce the spangle found on oak leaves, from which emerges, not Neuroterus, but Spathegaster baccarum, a distinct type with both sexes; who form the currant like galls found on oaks, from which Neuroterus is again developed.
[Sir J. Lubbock Address Brit. Assoc. 1881.]

The question arrises here—How has the marvellous balance of sexes, all through creation, been maintained?—some females always have male offspring, some, only females, while others alternate. As it cannot be fortuitous, the lowest forms being all monœcious, the preservation of a balance between the sexes, is irrefragable evidence of creative foresight. None of Mr. Darwins factors could have any influence here.

CHAPTER XIII.

EMBRYOLOGY.

The new school of Comparative Embryology, is trying to discover the secrets of creation, by plunging into embryonic mysteries: and has propounded the following rather obscure proposition. "Each organism in the course of its individual ontogeny reproduces the history of its ancestral developement, *i e*, each organism, reproduces the variations inherited from all its ancestors, at successive stages of its ontogeny, which corresponds with those at which the variation appeared in its ancestors." *

Mr. Darwin has also devoted a chapter to the subject, he says, "Embryonic resemblances are

* Balfour Embryology. p.3. The author says, "This science was formerly confined to the developement of the egg; but now it embraces the anatomy and physiology of an organism till it arrives at the adult state."

accounted for, by the progenitors of existing species having varied after early youth, and having transferred their newly acquired change to their offspring, at a corresponding age. The embryo is thus left almost unaffected and serves as a record of the past condition of its species.

The appearance in embryos of the higher vertebrates of arteries resembling those of fishes gills, and the phenomenon of yelk segmentation which presents an analogy to Cœlenterata, are adduced in proof of the theory. More or less similarity in organism is found in all species; but it is a question, if it is owing to a common descent, or only a tendency in nature to repeat its work. [v. ch. xv.]

What Mr. Darwin calls, "variation after early youth," seems to be only the maturing of forms. The development to the adult state varies considerably. Some attain their full characteristics before leaving the egg, the only difference between parent and offspring, being in size, as in the case of spiders, lizards and snakes, while many do not attain all their characteristics till

some time after, although they leave the egg with a form similar to the parent.

Although according to the dictum quoted variation appears in offspring, at a corresponding age, yet he says at page 392, "It sometimes appears at an earlier age in the child than in the parent."!

In some cases, he says, "The young will closely resemble the mature form, in whole groups; caused by their having to provide for themselves at an early age, and from following the same habits."

The embryos of a host of species have no resemblance to the mature form—yet they provide for themselves as soon as they leave the egg; and in some instances lead a similar life to their parents.

Mr. Darwin adduces the stripes on the lions cubs, and the spots on young blackbirds, as embryonic resemblances, and says "The stripes on the shoulders and legs of several of the horse genus, are easily explained if we believe them descended from a striped progenitor, in the same way, as all fancy pigeons, are des-

cended from the blue and barred rock pigeon."

He takes it as granted that the progenitors of the lion and horse, were primarily striped, but they may have been plain skinned.

The feline family are so closely allied, they may be descended from a common ancestor with either a plain, spotted, or striped skin. If it was plain or striped, the cubs of a panther should be the same, which they are not but the pard sometimes has a black cub! It is difficult to see, why the young lion is the only feline that shows its ancestry? The lion is not the only feline with a plain skin.

White and grey horses, when foals, are nearly black, and it might be argued from this, that the progenitor of horses was black.

Swans are grey till two years old, when they become white: but some swans are black—Was the primal swan black or grey?

It seems impossible to account for colouring on any theory; there are striped and spotted species all through creation: and albinos often occur. Human albinos have buff hair and pale

coloured spots on the skin, and so have some elephants, but those entirely white are very rare. They are common among spotted deer (*Axis maculata*)and musk deer (*Moschus meminna*). There are also, white ravens, and blackbirds! True albinos have a pink iris. It seems paradoxical, but black and white or grey are the same.

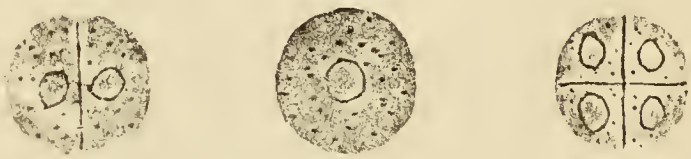
Black Presbyte monkeys have a tendency to turn grey, and are often albinos with white faces. Another white variety, Presbyte albino, has a black face.

Some elèphants when born are covered with dark hair. If this is a "record of descent" from a hairy progenitor such as the woolly mammoth: On the same principle—If mankind are descended from an ape, their young offspring should be hairy, and the hair should disappear at the same age, Mr. Darwin says, our siman ancestors "denuded themselves with ornamental design."

The analogy suggested between Cœlenterata and the subdivision of the Blástoderm, or germ of the egg into two layers, is superficial. A differentation between the outer and inner body exists in some amoeba—so that Cœlenterata

are not the earliest instance of this form. Again although yelk segmentation is universal; all species do not divide in the same way. Some divide into two, others into four parts.

The cup form, which is very common, is said to be the, "embryonic repetition of an ancestral type, called Gastræa....The walls of the cup are formed of two layers...the inner, is the digestive membrane, and the outer the skin."[Sir. J. Lubbock Address Brit. Associat.]



Examples of yelk segmentation (after Lubbock.)

This we submit is no proof of "descent from a typical ancestor," but of development from a common ground plan: All organisms have an inner and outer skin, the mucous membrane and the epidermis. This is invariable, although beings differ widely, in the nature of the filling in, between the skins.

All beings in the early stage of existence naturally resemble simple forms of life. Complex

organisms are not single entities, but aggregations of cellular entities. There is no other way of building up an organism, but through cell multiplication, consequently the germ presents nearly the same appearance in all species.

It is only here and there, that embryos give the alleged clue to their ancestry: Mr. Balfour F.R.S. tries to account for the omissions thus, "If each organism contained in its development a full record of its origin, the problem of phylogeny would be in a fair way towards solution ...Such is not found in nature, development as it occurs, is the result of influences of which hereditary is only one, thus the embryonic record as presented to us, is imperfect...being abbreviated, in accordance with a tendency in nature (explained by the survival of the fittest theory) to attain her ends by the easiest means. Time and, sequence, of the development of parts, is often modified, to fit the embryo for the special conditions of its existence."(p. 3.)

Was there ever any thing more hypothetical?

With reference to the blindness of young carnivorians. It is remarkable, their legs are not

out of proportion to their body, while the young of the horse genera, and of ruminants, are very long-legged. Is this length of limb an "embryonic record" of descent from a very long-legged progenitor?—Or a providential arrangement, which enables the young of such species, to keep up with their parents in a race for life?

As explained in the next Chapter carnivoria are born blind: and it may be argued, this blindness is an embryonic reproduction, the young of duck moles, and marsupials being blind, or immature at birth. Whether a record or not, it is a wonderful instance of creative foresight, and the universal fitness of everything in nature.

It must be admitted the disproportionate size of the hind legs of kids and lambs, has some analogy to the kangaroo, but the fore and hind legs of foals and calves are the same length.

CHAPTER XIV.

SELF PRESERVATION.

An inborn and instinctive dread of some mishap that wouid put an end to existence, commonly called the instinct of self preservation, exists through animated nature: and in this instinct we have probably the origin of fetichism. Colonel Mallery in a Memoir on the Mythology of the Indies, supposes animal and nature worship &c., are not traceable to any degradation of a primal revelation, but a purely natural, wide spread, and gradually developed product of the human mind, graduating from the fetichism of the savage, to the higher nature worship of the Indian Aryans.

However it is sufficient to show that mankind every where, and in every age, have had the instinct of fear, and belief in some being, or power greater than themselves: but there is an objection to the idea that animal worship proceeds

altogether from fear, in the fact that the carp, cat, and ibis, were worshipped, as well as venomous snakes, the crocodile, and savage beasts. [*vide* DePauw.]

Self preservation being a fundamental law of nature—The question is—How did low organisms acquire the instinct? As much foresight being required to protect an animalcule as an elephant. Mr. Darwin evades this difficulty by saying he has, "Nothing to do with the origin of mental powers...being only concerned with the development of instincts &c."

Surely the preservation of the lower members of creation could not have been left to chance! Are we to believe they were merely endowed with life, and then launched in the world?—

Just piloted off! and bidden "farewell."

Mr. Darwin says, No instinct can be produced by natural selection, except by the slow accumulation of numerous slight variations. A theory inapplicable to the lowest scale of beings; yet they are as well protected as the most sagacious: for although all possess the instinct of self preservation, it is only effective to a certain point.

The same power that has arrested the development of species, beyond certain lines, has also limited the development of instincts.

An abnormal development of the instinct of self preservation, or any other instinct, in one species, would necessitate a corresponding development in all. An unlimited development of sagacity in beasts of prey would obviously disturb the order of nature. [*vide ante* pp. 22 28 30.]

Biologists say, it is an insolvable problem—how low in the scale of life consciousness exists?—whether as Mr. Huxley puts it, "a crayfish has a mind or not." He implies that beings are mere automatons. "Pieces of mechanism whose internal works give rise to certain movements when affected by external conditions."

If animals were only automatons they could not protect themselves from various mishaps.

Self preservation requires consciousness, or some other perception of external danger to guide animals in safety.

No doubt our acts are often mechanical, but serious accidents occur, when the safeguard of

consciousness is suspended by what is variously called, "absence of mind," "inadvertence,"&c. and people get mechanically, into the "jaws of death." The power of sight and hearing being of no avail to save them.

Somnambulists are automatons for the time being, and have been known to unconsciously walk out of a window.

Mankind and animals when panic stricken, often rush mechanically to destruction because the intelligence that ordinarily guides them safely is paralysed by fear.

Dr. Allman says when the swimming spore of an alga, avoids collision with an obstacle in its course, by reversing the stroke of its cilia. This certainly is nought but a purely unconscious act.

But how is the animal machine set in motion, when at rest?—On his theory it could not move unless some accidental external stimulus happened, and is therefore devoid of independent action, or volition, essential properties of life.

Spallanzani discovered that bats have a marvellous perceptibility, which enables them, even when deprived of sight and hearing to direct

their flight with unerring accuracy. This may be owing to protoplasmic sensibility. But then why does it not guide mankind ?—we all know; if we move about a room in the dark, we are sure to stumble against something.

There are many instances of peculiar organism for the preservation of the individual, which must be more or less, directed by consciousness.

The fire fly can extinguish its light to escape observation, and suddenly vanish when pursued. Then there is the case of the cuttle fish, but it has an embryo brain.

Conscious self preservation exists sufficiently low in the scale of life to be incompatable with the belief that mental power, requires a corresponding physical development. The lower animals are often more intelligent, than the higher.

An organism might perform some functions mechanically, such as seizing prey within its reach like a carnivorous, plant: but there are acts that cannot be thus explained, such as the ant lions pitfall, or the making of a spiders web. It is said spiders vary the texture of their webs,

according to the nature of the prey they desire to entrap. The spiders web seems to be the prototype of the fisher-mans net.

The law of self preservation is most remarkable in the case of offspring. The salmon makes frantic efforts to overcome obstacles in its way to a spawning ground. Unless it has some inherent instinct impelling it to the best place to deposit its ova; it would leave them any where, and let them take their chance. Then see the forethought displayed by birds in nest building, and rearing young. The sagacity of the female during incubation, never leaving the nest long enough to chill her eggs. It is said parental care is only exhibited by warm blooded animals, but ants prove the contrary.

In many cases the young are protected by means beyond the control of either parent, or offspring. Take for instance, carnivoria. The stealth required to capture living prey, necessitates that carnivoria in quest of prey,should not be accompanied by their young, who are thus born blind, and remain so for some weeks, with a twofold design,—to prevent their following

the mother, or wandering during her absence.

The carpenter bee deposits its eggs in holes which it bores in wood, and closes them with the wood dust cemented. The pupa's head is always found next to the aperture !

The Zeuzera æsceti larva, that preys on ash trees, bores a tunnel through the stem towards the bark, which it eats away, leaving only a thin outer skin ! It is then transformed into a pupa who easily liberates itself at the time of exit.

These and many similar cases are "irrefutable evidence of creative foresight," to use the words of Professor Owen about kangaroos, and their young at birth time.

Mr. Darwin prefaces his remarks on instincts by saying—"Many instincts are so wonderful their development will probably seem a difficulty sufficient to overthrow my whole theory."

He argues, "Many instincts may have been gradually acquired, through the inheritance of habitual habits,'—but admits "The wonderful instincts of ants could not have been acquired by habit."

It would be difficult to explain the origin of food storing instincts. Bees are supposed to store honey as a provision for winter; but it is doubtful if that is the real motive, as wild bees in tropical climates collect honey, and make cells in the hollows of trees, and is used by jungle men for preserving venison. In a land of perpetual summer, bees could obtain honey all the year round. Porcupines also store grain in their burrows, which the natives take and use.

Mr. Darwin, mentioning the cuckoo, says "There is no more difficulty in its case, than in a young bird acquiring the instinct to break its shell, or in young snakes acquiring in their upper jaws a transitory tooth."

The young cuckoo has probably no instinct of the kind attributed to it. Being often much larger than its foster brothers, they would naturally be thrown out of the nest when they quarrelled, and they are not always ejected.

The habit of depositing eggs in strange nests is not peculiar to cuckoos, and their habits vary, some tropical species make nests, and rarely migrate. The habit may have originated

in the circumstance, that migratory birds usually return to their old nests in the places they visit periodically. Swallows rear young in old nests, year after year.

The Hindus say, in some cases, the old birds discerning in the young cuckoo, none of their offspring eject him from their nest: but this is doubtful. Birds seem to have no instinct of the kind, although ants have. Domestic fowl foster ducklings as if their own.

If, as Mr. Darwin admits,—ants cannot have acquired their instincts by habit, neither could a bird acquire the instinct to break its shell, by habit. He furnishes an argument against himself, in mentioning the case of the short beaked tumbler pigeons, "who are unable to liberate themselves, and fanciers are obliged to assist them," as it shows birds, or reptiles could not have gradually, acquired the power to liberate themselves, unless there was some gradual and corresponding, nice adjustment of conditions, requiring a creative foresight incompatible with his theory.

The eggs of oviparous snakes and turtles are

soft, therefore the young of such species, have a transitory tooth which enables them to cut it.

The eggs of most lizards, and crocodiles are hard and brittle. Only some reptiles liberate themselves, all sea, and many land snakes are viviparous.

While the tooth was developing, how was the young reptile liberated?

Or how was the shell broken before the imprisoned bird acquired the instinct to break it?

We cannot conceive how on any suppositon, the tooth, and the instinct to use it, could have been acquired in accordance with the Darwin theory. The gradual development of forms, by its factors is something quite different from this wonderful provision.

Mr. Darwin considers that the slave making habit of ants, arose from their taking the eggs of other ants into their nest for food, and some being hatched before they were eaten, became members of the community. But Sir J. Lubbock has shown, that ants always attack, and kill strange ants, or pupæ, if put into their nests.

CHAPTER XV.

REPETITIONS.

It is said when we find in an animal, any characteristic of another genus, any seemingly useless appendages, they are relics of descent from a common ancestor, not yet worked off in the process of development. But there are many resemblances, and strange anomalies in nature which cannot be explained by this theory, and which show that nature often repeats her work, both in outward form, and internal organisation. For instance, have Mantidæ inherited their leaf-like form from plants?

The term, "common ancestor," &c. is rather misleading. If there were several progenitors, (*vide* p. 7.) the term, would mean the progenitor of each order only; and any similar organism, found in members of different archetypes, could not be the result of "ancestral inheritance."

The author of "Vestiges of Creation," rem-

arks that most animals have superflous organism: exhibited in the embryo teats of males. In many cases the position of the mammillary organs, is so excentric, it cannot be accounted for by any theory. "Male equidæ, such as the horse, or ass have rudimentary nipples, concealed in a prominent annular preputal fold of integument."[Owen Anat. of Ver.]

We find some lemurs with four nipples, two pectoral and two inguinal; others have both pairs pectoral, while the flying lemur has two in each arm pit! Some orangs have three, two being on the left side, one above the other!

Pectoral teats occur in mankind, sirena and ant-eaters, the highest and lowest forms.

Most rodents have inguinal teats, but in some cases they are in pairs,along the abdomen like carnivoria. Some pachydermata have only two inguinal,teats while pigs are like carnivoria.

The tropical hedgehog has twenty two, and the European only ten. Bats, sloths, and armádillos have two pectoral. The prehensile porcupine has one midway between the fore

and hind leg, and one midway between it, and the fore leg. All the Cervidæ have four teats. Some domestic cows have a superflous pair.

The nipples of the porpoise are concealed in a cleft, an arrangement repeated in marsupials, while the mammillary glands of other Cetaceæ resemble those of the duckmole.

The dentition of animals is equally excentric. Some rodents, such as the horse, have rudimentary canines: and in some ruminants they are fully developed. The canines and incisors of pachydermata, take very excentric forms, shown in the pig of Celèbes. The fangs of carnivorians and snakes are almost identical.

Physicians have not yet ascertained the real use of the spleen. They only know, that every person has one.

Elephants have no gall bladder, the hepatic duct being like a giraffes.

The dove tribe, and some other genera of birds, are also devoid of gall bladders, while all other birds have them.[Owen]

Chamelions, and many lizards, have air cells under the skin, inflated from the lungs. A sim-

ilar organism is found in some African bats, and in most marine birds. Some birds, chiefly diurnal birds of prey, have aërated bones, while owls have marrow in the femur. It is impossible to account for this excentric organism as ancestral relics, or show it is necessary, seeing that many marine, and all other water-fowl have no inflating power: and pigeons are so powerful on the wing, it shows air in the bones is not required for flight.

The Diodon hystrix, or porcupine diodon, a variety of balloon fish, has spines like those of the true porcupine, while varieties of diodon, resemble in the arrangement of their spines varieties of hystrix.

The hair of insects and quadrupeds is identical, and the fur of the racoon and some other species is like the down on young birds.

The fur coat of terrene species, is found in aquatic species, such as the seal.

Cephalopoda rapidly change colour by the muscular expansion and contraction of a multitude of pigmentary cells, called by Wagner "chromotophòres." An identical organism in

the skin of the chameleon, causes the change of hue, that has attracted the attention of naturalists, since the time of Aristotle. More or less change in colour, is also observable in many lizards and tropical frogs.

It may be argued that porcupines, and diodons being all vertebrates, the spiney skin may have been transmitted, although it is difficult to see how this could be: but few evolutionists, would say, Cephalopoda, or insects were the progenitors of vertebrates, so we may infer the skin of the chameleon, and the hair on insects are cases of repetition of organism. To which we can add the following.

The blood of house flies is red, like that of vertebrates: the blood of all other articulata is colourless.

The eyes of hammer-headed sharks, are arranged like those of dragon flies, and Cassidiadæ, or tortoise beetles, have elytra formed like the shell of a tortoise.

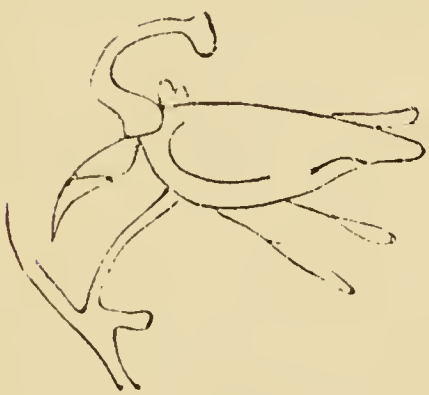
Gasteracantha spiders have spines on their backs, like some lizards. The Mygale fasciata spider has retractile claws like a feline animal,

and the Periophthalmus papilio, an Indian fresh water fish, has a double dorsal fin like a butterflies wing.

Mantidæ are instances where animated beings resemble the inanimate. Some are brown like a faded leaf, others bright green, of varied hues.

Nudibranchiate molluscs, called sea nymphs also resemble leaves and branches of plants. Pteropoda have a sort of wing like a butterfly, while Sagitta have the tail and fins of a fish.

In Trichosanthes, or snake gourds, and orchids, we have plants resembling animals. An orchid termed the "Spirito santo," in Panama, resembles a dove alighting on a flower. Also the one figured here which grows in Ceylon.



Liparis atropurpurea.

The nut of a floating plant called Trapa bicornis resembles the head of an ox with horns, and the conformation of the walnut resembles a human head. The rind represents the outer

skin, or pericranium, the shell is the skull: while the yellow skin, and convolutions of the kernel resemble the brain, and its pia mater. Then there is the Ophioglosum, adder tongue fern, kidney bean &c.

Drosera, and other carnivorous plants, not only capture prey like an animal, but form a secretion resembling gastric juice.

Many instances of repetion occur in habits and organism designed for self defence. Porcupines erect their quills and triger fish their spines at the sight of an enemy. Aphides when pursued by ants exude a drop of sweet juice which the ants devour, and their pursuit is arrested. Mr. Darwin considers it an instinctive habit. But, more probably it is the result of fear, which causes a premature emission of a regularly voided secretion. Monkeys are often prematurely effected by fear, and possibly we may include the pole cat, the cuttle-fish, and the offensive fluid squirted out by toads.

Mr. Wood points out " How strickingly rodents reproduce some idea more fully manifested

in other orders. Rats are as blood-thirsty as tigers, squirrels play the part of quadrumana, and bats have the habits of birds...Then other species show a tendency towards the forms and habits of rodents. The Aye-aye is like a squirrel, and the Hyrax Capensis, a pachydermous animal, is like a rabbit, even in dentition, and was classed with rodents."(p. 611.)

More or less similarity in habits exists through nature. The Mus minutus, harvest mouse, builds a winter nest among reeds like that of the reed warbler, and a fish called Epinoche makes a nest of moss, in which its eggs are placed.

The Atta cephalotes a large ant of Columbia, the brush turkey, and some other Australian birds, hatch their eggs in hot beds of leaves.

The Ixalus hypomelus tree frog, carries its ova under its stomach, like shrimps, and the Aspredo a S. American fish. Lockwood quoted by Mr. Darwin, says, The ova of the Hippocámpus, or sea horse, are hatched in a fold of skin formed near its tail, and its young nourished by a secretion. A striking resemblance to marsupials.

It is either a repetition, or we must suppose marsupials are descended from pipe fish.

The following instances of repetition occur among vertebrates. The camel-leopard, or giraffe, has the head of a horse, and is spotted like a pard, while the gnoos, a kind of antèlope, a native of South Africa, has the hind quarters and tail of a horse.

The Caretta imbricata, hawks bill turtle, has a mouth like a hawk's bill, and is covered with horny plates formed like those of the Manis tetradactyla, one of the scaly ant-eaters. The small arboreal ant eater, and chameleon, which lives in trees, have prehensile tails, like South American monkeys.

The Surinam toad and tree frogs, have web feet: while the aquatic dodo had free claws, like a land bird.

Bats with nasal leaflets strangely resemble the star nosed mole.

The Abyssenian ape, the Tartary buffaloe, and some other species, have exceedingly long hair on their sides.

The baboon Macacus kynocephalus has a dogs head, the Hippocampus is like a horse, the Raja aquila, is named from its likeness to a bird, and the fish Plantax vespertilio, from its resemblance to bats.

The jumping rats, Hypsiprymnus minor, and Jerbillus Indicus, resemble minikin kangaroos.

The elephants proboscis is repeated in the Cetacean called the sea elephant, in the shrew mole, and in the Macroscelides proboscidens, or elephant shrew.

The horn of the rhinosceros is repeated in Ceratophora, or horned lizards.

Behind each teat of the gazelle, there is a pouch of skin. It may be said, it is a marsupial relic.

Sir J. Lubbock referring to Mr. Darwin's work says "Now we see at a glance: that the stripes of the tiger have reference to its life among jungle grass; the lion is sandy like the desert: while the markings of the leopard resemble spots of sun shine falling through leaves."

In some cases there may be a connection between the colour of an animal and its habitat,

tree frogs vary their colour to harmonize with surrounding objects, and some arboreal snakes are as green as the foliage in which they live: but many are brown, or dark, and in most cases it is not possible to trace any connection between the colour of an animal and its habitat. There is a spotted hyena, and a striped zebra in the same locality as the lion. A striped tiger cat, and several vivera, live in the same habitat with the leopard.—Why are they not spotted likewise? Then there is the little tiger fish of Indian rivers, a striped dogfish &c.

Mr. Darwin says "The similarity in the mechanism of a mans arm, wing of a bat, fore leg of a horse, and the fin of a porpoise is traceable to community of descent."

Is it not as probable nature has repeated the mechanism because no other would suit?

A similarity in the conditions would often necessitate similar mechanism for very different species. A retractile claw being a useful weapon to the predatory kind, whether feline or insect, such as the tiger and Mygale spider, they would naturally be endowed with it. Thus

very different species would possess similar mechanism quite independent of "community of descent."

From what ancestor has the elephant derived the reptilian form of its hind leg so unlike other pachydermata?—The hind leg and foot of a tortoise are very like an elephant's, and their whole form is very similar.

Cuvier's extinct Palæotherium, which is said to connect tapir, horse, and rhinoceros, has three hoofs like existing tapir, and his Anoplotherium, likewise extinct, connecting pigs and ruminants has two.

The two little hoofs of the fossil Hipparion is considered a proof the existing horse, is descended from a tri-hoofed ancestor.

Pigs and ruminants have also two little hoofs, so their progenitor must have had four.

Some Ceylon, and Indian elephants are five toed, and some have only four toes on the hind leg, and the African but three. The fifth toe of carnivoria hangs loose.

There is also a great difference in the toes

of birds and reptiles. Struthio camelus, the true ostrich, has only two, the rhea, emu, cassowary, and moa, three: all other birds have four, toes, except the Ceyx tridactyla kingfisher, which has three, and Dorkings five; like most reptiles except the four-toed Sitanae lizards.

All this seems to show species are descended from a five hoofed or toed ancestor. But if so one would imagine, on evolution principles, its most distant descendants would retain the fewest useless claws, hoofs, or toes.

The same diversity appears in caudal vertebræ. Some apes have long tails, some have none, and those of goats and rabbits are very short. Some reptiles have very long tails, others have none. It is difficult to reconcile the differences with any theory of descent.

It is said all limbs have been gradually developed from certain points of the long limbless vertebrae of a fish: consequently the length of progenitors tail, would have depended on the the distance the hind limbs were produced from the extremity of the fishes vertebræ.

If Mr. Darwin's "Reptile like amphibious

progenitor" * was short tailed, or frog like; the long tails of so many extant species are an AFTER development. On the other hand, if the progenitor had a long tail—How is it that frogs, and birds, who are nearer related than quadrupeds have no caudal vertebræ?

Marsupials likewise, from whom Mr. Darwin says "quadrupeds and all the higher mammals are derived" have very short tails.

If limbs have been developed in the way stated, long tails would be seemingly useless relics of descent—or an after development. It would puzzle an evolutionist to explain, why Cercopithecus has such a long tail, and the Barbary ape is tailless?

It is said long tails are useful for driving off flies. But how so with a woolly sheep? èlephants drive off flies with a branch held in the trunk.

* Descent of Man p.389.

CHAPTER XVI.

ANTIQUITY OF MAN.

When it is argued, mankind are descended from the quadrumana, it should be considered they are almost as ancient as their alleged ancestors: for although man like most of the higher animals, seems to be of comparatively recent origin, it is evident he has survived considerable physical changes in the globe, and has seen the extinction of a host of contemporary animals, such as the mastodon and mammoth, the cave lion and hyena, Ursus spelœlus,a gigantic bear, Cervus megaceros, the great Irish deer, and R. tichorinus, or woolly rhinosceros.

Some years ago fossil men would have been regarded as mythical subjects, but of late years astonishing discoveries have been made showing the antiquity of mankind. Several distinct ages, named from the materials with which weapons were made, have been recognised. The Palæo-

lithic, or early stone age, followed by the Neolithic, or newer stone period. Then came the bronze age, and the iron age. Although no trace of metal has been found in caves of the stone periods, many implements of bone and bronze have been. Implements of stone, taken alone, are not a strong proof of antiquity, as they are used at present, by several races.

Professor Nicholson remarks, "There is some evidence, of uncertain value, showing that man existed in the latter part of the tertiary period...possibly even in the miocene age. If this were established then man as a zoological species, would possess greater antiquity than the higher mollusca."(Palæ. ii. 423.)

Some Anthròpologists object to the term primal, being applied to savagès of the mammoth period, there being no reason to believe they represent man, as he first appeared. The relics found in drift beds, and caves, show more or less art and progress from a ruder state. [Address British Association 1879.]

The neolithic caves of Wales, explored in 1874, have furnished skulls, and bones, of men

five and a half feet high, resembling Basques; while the pleistocene caves, and river gravels of Germany, give evidence of a race similar to Esquimaux: great physical changes have occurred since these palæolithic men existed.

Mr. Pengelly who has explored the caves of Devon, is of opinion the early inhabitants of Britain, saw it joined to the continent, and again become an island. The Pyreneeán caves have yielded bones of men, mammals, birds and fish, some implements, and a rude drawing on a fragment of slate, of a man in a skin dress. [Report Brit. Asso. Geol. Record 1873. 4, 5, 6.]

Geologists suppose mankind existed at the close of the so called glacial era: but it is now stated on good evidence, that glacial phenomenon have occurred at intervals since the Cambrian period, which is very probable. The earth in its orbit periodically oscillates within certain limits, which produces alternate periods of increased heat or cold, in each hemisphere. Sir J. Lubbock says, The last glacial epoch began about, three hundred thousand years since, when the orbit varied from 25° to 27°.

The use of bronze and iron in Egypt, must have been preceded at an immensely remote period by an inferior degree of art. Egyptian civilization was as perfect in the III, as in the XVIII Dynasty. If the Egyptians, as some think, came from the south—How long would it have taken such a race as the Negro, to pass through the preliminary stages of civilization? —especially, considering the tendency of mankind to run in old grooves. On the other hand, in some instances, the change of habits has been extraordinarily rapid. It is only a hundred years since Captain Cook was killed by the Sandwich islanders—to day Honolulu is a little Paris, full of Casinos and Cafés.

If "the primal home of man" was some tropic isle, where, according to Anthròpologists

> The nimble monkey improved each shining hour,
> Till he left his tail in his primal bower!

How many thousand years must have elapsed before primal man wandered so far north as Britain? If we find man had spread all over Europe, North America, Asia, even Siberia, in the pleistocene age, he must have existed in

the tropics in the miocene age. It is well known that a primal state is always accompanied by small fecundity, and great mortality of children. A vast time must have elapsed before mankind could have migrated so far from their birth place: and relics show they were very numerous in the pleistocene age. They are found every where. In the cuttings of the Madras railway, in the raised beaches of Natal, in Cambodia, and the kitchen middens of Japan. In the alluvial drifts of Eastern Russia, and the glacial deposits of Colorado, in Yucutan and Central America, where ruins of prehisoric cities exist, which would be worthy of modern Europe.

The latest works on the prehistoric races, are "Fossil men" by J. W. Dawson F.R.S. and "Early Man in Britain" by Professor Dawkins. From which, and other sources, we gather the following. Mr. Dawson as an anti-evolutionist, produces much evidence showing the antiquity of mankind, and so far from being of simian origin, they have, judging by some specimens, degenerated from early types. A "magnificent

specimen six feet high, called the Old man of Cro Magnon"(probably the "Grand old man" of his day) has been found in a cave near the river Vézere in France. Dr. Broca the Anthòpologist, admits the skull on the whole shows great volume of brain, and marks of superiority only found in civilized races; at the same time there is evidence of a violent and brutal race. The thigh bone has the mark of a spear thrust, and the skull of a female of the same period, shows death proceded from violence. So it seems on the score of brutality, we are almost on a par with our fossil ancestors.

Professor Dawkins is not inclined to give a greater antiquity to man in Britain than,the end of the pleistocene period; arguing on evolution principles, that man being the most developed mammal, he could not possibly, have appeared much earlier, [but Britain was not mans birth place.] Britain and Ireland were then joined to the continent which extended far into the Atlantic, and at an earlier period, probably joined to America. The British mountains were then of Alpine height, and the climate varied from

glacial to tropical. Its primal inhabitants the River drift-men, seem to have been hunters of the rudest type, preying on the hyena, lion rhinosceros, and elephant. But it is admitted there is no evidence of their descent from any inferior animal.

The hyena seems strange food to us but it was eaten by Egyptians. "Elephantophagi" are mentioned by Greek, and Roman authors; but elephants flesh is not used by any modern race, the Veddahs of Ceylon have an antipathy to it, but they will eat lizards and monkeys.

A similar race to the River drift-men was spread over the old world, and were succeeded by the Cave-men, a superior race, as shown by their implements and ivory carvings: the Cave men, who were of low stature, and probably the ancestors of the Esquimaux, were superseded by the Pre historic farmers of the Neolithic age, who drove the Cave-men before them. By this time it is supposed Britain had assumed its present insular form.

The Pre historic farmers, ancestors of the Basques of Spain, and allied European races

were partly exterminated by the Celts, forming the van of the Aryan migration into Europe, and who introduced the bronze and copper weapons so prized by Archæologists. [A double battle axe of pure copper was found in the lake of Brienz, a few years since; and similar weapons have been found in Denmark.]

There is not much difference between the habits of the Cave, or River drift-men, and the Veddahs of Ceylon, who live by the chase and partly dwell in caves, where they leave their dead unburried, whose bones are often found, like fossils in European caves.

Professor Dawkins says, the Cave-men were a "mild and unwarlike race like the modern Esquimaux, and fled before the Pre historic farmers," which are not the traits one would expect in the semi-human offspring, according to the evolution theory, of the fierce gorilla, or some similar animal.

The manners of the Ostiaks are very probably a survival of pre historic habits. Their habitat in Siberia presents the characteristics of

France and Germany, during what is called the Rein-deer period, when vast fields of moss, intersected by small woods of fir trees, were the chief feature in the landscape.(*v.*ch.xix.)

The following accounts of some recent finds are taken from the "Times." M.Poliakoff who has been making explorations in Russia, has found numerous skulls of the Neolithic period, and Palælithic implements, with bones of the mammoth and rhinosceros, &c. the deposits proving beyond doubt the coexistence of man with those extinct animals. A human skeleton, many skulls, and bones, with stone implements have been discovered about twenty feet below the surface in lake Lagoda.

A Paper on the "Stone Age in Japan," read at the Anthròpological Institute, was illustrated by a collection of bones, showing indications of cannibalism; stone axes, chisels and arrow heads, like those found in all parts of Europe.

The Academy says the Postmaster at Saint Vallier near Cannes, has discovered in a neighbouring tomb the carbonized skeleton of a very powerful man surrounded by weapons, of

bronze and flint, and bits of pottery of the Neolithic period

Fossil Apes.

No entire skeleton, or the skull of any species of catarhina ape, has been found anterior to the period we know mankind existed, while there are scores of human skulls. Relics of apes are remarkably scarce, although so many fossils of other contemporary animals exist. The bones of sixty species of quadrupeds and birds, some entire skeletons, have been discovered in the gypsum quarries near Paris.[Lyell Elem. Geol. Gervaise Palæ. Française.]

Europe may seem, not the place to look for a fossil ape, the tropics being the home of quadrumana: but it is a curious circumstance, that nearly all simian relics, and also the oldest, are European, or N. American. It is also notable that a small brown macaque inhabits the rock of Gibraltar, whose fossil ancestor has been found along with remains of elephants and rhinosceros, in British pliocene deposits.

The Indian geological surveys have revealed many fossil mammals, reptiles, and birds; but

apes are as rare as elsewhere. [Lydekker Palæo. Indica.]

The oldest simian relics, yet discovered, are the fragments of a doubtful species resembling Semnopithecus, dubed Mesopithecus Pentelici, from miocene deposits in Greece. The same strata of Italy and France, have yielded a few other doubtful specimens, the most important being two jaw bones, and portions of a thigh bone of a large, and a small ape, found among trunks of oak, turned into lignite, near Auch in the Department of the Gers. Drawing largely on the imagination, one of them is said to have been "a tree climbing frugivorian, the size of a man" and existed on acorns! Hence it has been called Dryopithecus, and the smaller Pliopithecus. M. Gaudrey says the alleged miocene flint implements were made by these apes!
[Comp. Rend. de l'Acad. des Scien. 1859.]

The other known fossils of true apes, all belong to extant species. Semnopithecus and Macacus found in miocene and pliocene strata Siwalik hills, Cercopithecus from pliocene Italy and France, and a jaw of a Macacus in Essex.

Relics of the other genera of quadrumana are more numerous: but they are not considered to be anthròpods by most naturalists. Although M. Hæckel in his "History of Creation," says man is an offspring of the catarhina family, he now thinks lemurs the probable progenitors, which M. Milne Edwards disputes.

A number of fossil lemurs, who are only half monkeys, have been unearthed in Europe, the principle being Rutmeyers Cœnopithecus, and the Palæolemur nicrolemur of Gervaise, from eocenè and miocene deposits. The Cœnopithecus is supposed by some, to be a kind of howling monkey: all true platyrhina fossils come from Brazilian post-tertiary caves, and all belong to existing species.

Dr. Marsh has discovered in North American tertiary strata, several curious lemurs with the whole dental series. One genera, with four incisors less than the others, resemble marmosets.

It has always been a favourite idea of naturalists, that man's birth place was an island in the tropics, where fruits abound, and the climate

suited to a being born without a covering." On this supposition a fund was lately raised for searching the caves of Borneo, but the search as yet, has been fruitless. [Report Brit. Assoc. 1879.]

The Times has very justly remarked, "There are Philosophers who would be transported with joy, if an African traveller brought home news of a tribe rejoicing in well developed tails, entirely hirsute, or otherwise unmistakably subhuman." Africa however has been sufficiently explored to show it is a hopeless case, so M. Hæckel has submerged man's simian ancestors. He says "Neither Europe, Australia, or America, can have been the cradle of mankind,...most circumstances suggesting that the primal home of mankind was a continent now sunk below the Indian ocean, which extended from Madagascar, and South East Africa, to the Indian Archipelago,... ...Mr. Sclater has named this continent Lemuria, from the semi-apes who were characteristic of it." ! (v. ii p.325 ed .1876.)

M. Hæckel says mankind are not descended from any known anthròpod, but from an extinct

species of catarhina—but why are they extinct? Perhaps like the talipat palm—

Which shoots its golden blossom to the skies,
And then exhausted by the effort dies.
The birth of men proved their mortal throes,
And cutting a marvellous caper, left this land
of woes!

Hindu tradition points to the former existence of a South Eastern, land termed Lanka, of which Ceylon is a remnant, but although its fauna is sufficiently distinct from that of India to cause speculation, there is nothing to support the Professors theory; which is as absurd as the Moslem idea that Adam was exiled to Ceylon.

NOTE

The hirsute girl called, "Darwins missing link" exhibited at the Westminster Aquarium in 1883, turned out to be only one of the Burmese hairy family, described in Crawfords "Journal of an Embassy to Ava." Since the deposition of Thebaw, the whole family have been exhibited at the Aquarium: but although exceedingly hirsute, unmistakably human.

Another very hairy specimen of humanity, from the Russian province of Kostroma, was exhibited in St. Petersburgh about the same time.

CHAPTER XVII.

MISCELLANEOUS REMARKS.

Man And Ape Compared,—

Of all the marvels the world has ever heard,
Evolution beats them fully by one third.
With more than magic art, the hideous chimpanzee,
Transformed into a Venus Anadomené !
The Paphian Goddess rose from the ocean,
So the Greeks believed,
But this old pagan notion:
Is outdone by the Darwinian creed !

If mankind were of simian origin, it should follow that an ape is the most intelligent of animals, the nearest to man in mental power, as well as in physical structure: such however is not the case. Innumerable instances are given of the sagacity of other animals, but the quadrumana are among the least intelligent of beings. The cunning of a fox and the sagacity of a dog, are proverbial, and Sir. J. Lubbock thinks it "difficult to deny, even to ants, the gift of reason."

You can teach a monkey a few tricks, but it

is barely on a par in this respect with a horse, an elephant, or even a seal, which has in reality a more developed brain than a monkey. A performing seal has been exhibited at the Westminster Aquarium.

Although an apes tongue is like a man's, it cannot repeat a few words like a parrot, its hand resembles a man's, but an elephant is as handy with its trunk, a squirrel with its paw, a bird with its beak. Quadrumana are the most helpless of beings, they build no home, they cannot sew leaves together like a tailor bird, or form that marvel of skill a weaver birds nest. They show none of the social order and ingenuity of bees, or ants, and are devoid of the instinct that guides the migratory bird: which tells the swallow when the chilly north puts on its snowy vest, to seek the genial south.

Weaver birds nest.

There is nothing more marvellous in nature than the instinct which tells the migrate, not only, when to go, and return, but how?—Long before mankind ventured out of sight of land, migratory birds launched fearlessly over the pathless ocean in the annual flight.

It is said the orang makes a rude platform of sticks among the branches of trees,and the same is said of the gorilla, while the chimpanzee is described as making huts! but African travellers sometimes "draw the long bow" and little reliable information is obtainable about the three largest apes.

Neither are the quadrumana of any use to mankind who have utilized so many other animals. Surely if they were nearly related to man they would be his helpmates, but every where they avoid man's vicinity.

Professor Owen divides quadrumana into three divisions distinguished by the form of the nostril.

Catarhina are known by its running downwards, the term being derived from the Greek kata, downward, and rhines, a nostril.

The Platyrhina, from platus, broad, have flat nostrils, and the Strepsrhina twisted, from strepho, to twist.

Catarhina are the most developed, and are all natives of Asia and Africa, except the macaques of Gibraltar. None of them have any hair on the nose, some have cheek pouches, and tails, some, neither. Catarhina are subdivided into seven genera, viz. chimpanzees, gorillas, orangs, gibbons, hylobates, presbytes, and macaques. The last four are small species.

The chimpanzee, or Troglodytes niger, is the largest, being more than five feet high, next comes the gorilla, which is mentioned in the "Periplus" of Hanno B. C. 350, who says the interpreters call them γοριλλας. Du Chaillu believes the animal seen by the Greek mariner was a chimpanzee. The Simia satyrus, or orang, is a native of the Indian isles.

Platyrhina are exclusively S. American arboreal species, with prehensile tails. The Mycetes genera are "howling" monkeys.

Strepsrhina include lemurs, pottos, and áye-ayes, small species, found in the Indian isles

Africa and Madagascar. Milne Edwards and P. Gervàise, think Strepsrhina a distinct order, intermediate between carnivoria and simia. The head of a lemur is more like a fox than a monkey, and some are like squirrels, while all have claws instead of hands. (*v.* p. 48.)

M. Mivàrt in the "Popular Science Review" 1873, has pointed out that man's anatomy gives no satisfactory evidence of evolution from an ape: the dentition however is the same.

The small long tailed genera, such as presbytes, or macaques, are more like mankind than the large tailless apes, and have twelve ribs while orangs have only eleven, the gorilla, and chimpanzee thirteen. The Presbyte ursinus has very short arms, while those of the orang nearly touch the ground, but the gorilla's are shorter. Some zoologists deny that an apes hind foot is like the human. In every instance, the inner toe is separated from the others and is more like the human thumb; in some species it is absent.

Hartman believes the orang has the most developed brain,[*v.* Zoo. Record 1873.]but it is

certain the smaller monkeys are quite as intelligent. The Hindus believe their "hanuman" is the most intelligent. (*v.* Intro. p. 10.)

Although it is said the large apes often walk upright, there is little doubt the natural posture of simia is "all fours,"which they always assume when alarmed, or in flight. Sir. J. Brook of Borneo, says the orang never stands upright,

Orang skull.—British Museum.

or defends itself with sticks. The orang has no ligamentum teres, a very strong human muscle, which binds the thigh bone to the hip.[*v.* Jones Animal Kingdom.]

Du Chaillu says,the gorilla walks all fours, on its knuckles, and the same is said of the chim-

panzee. The organ grinders monkey, even if trained from youth to stand upright, never seems at ease in this position; and resumes its natural posture when it can.

It has been well argued, that man as a mere animal, could not have existed among the gigantic and ferocious creatures of the ancient world: he must always have had the superior intelligence he now possesses, which gives him the mastery over all other creatures, however formidable they may be. Yet according to the evolution theory, primal man could only have had a brain, little if any thing, superior to an ape, and could only have survived as an arboreal animal. All the simia resort to trees for safety.

All the catarhina are strictly frugivorians—How came primal man to be carnivorous?—All his relics show he was, although some mill stones, said to be of the "Bronze age," have been recently found in Switzerland. None of the fossil human skulls have the great canine teeth of so many apes, their best weapon of defence. Their absence would have left the embryo man quite defenceless.

Physiologists say, that the human stomach, is formed for the digestion of both flesh and fruits, and man can move his lower jaw laterally for grinding food like rodents, while purely carnivorous animals, such as tigers, can only move their jaws up and down like a pair of scissors. A grinding movement of the jaws would be difficult with the long canines of a gorilla: besides the muscles connecting the lower jaw with the head are arranged differently to the human. If we examine the teeth of the large apes, it will be seen that the canines have been pushed out of their places by coming in contact. There is a great difference in the dentition of simia, the canines of Macacus and other small genera are quite human.

The most ancient human skulls yet discovered, viz. those found in the Belgian caves, and one similar from Michegan, are fair average skulls equal to Polynesian; and it is admitted that the skeletons of primal man, differ little from ours; and as yet, there is no evidence showing a gradual evolution of the human type. [Address British Association 1878.]

Dr. Humphreys F.R.S. in his Rede Lecture on Pre-historic man at Cambridge 1880, says "Although there is a strong probability that the appearance of man on earth, was the result of some great law of evolution, the geological record has as yet, given no indication of it."

A very ill shaped thigh bone, found in a cave at Mentone, has been cited as showing the existence of an inferior type of mankind: but it happens, there is a similar bone in the College of Surgeons London. [H. Spencer Sociol. p. 42.]

Professor Dawson quotes a memoir sent to the French Académie des Sciences, giving the measurements of several pre-historic skulls, and comparing them with modern heads, and it appears the smallest of fossil skulls, are nearly èqual to the most capacious of modern.

It is stated on good evidence that there has been a gradual diminution in the size of heads in England during the last quarter of a century. Hatters also say our heads are smaller. It is argued, if our frames are smaller, our heads must be the same; as they generally correspond to the size of the body. [*v.* Academy Mar. 19 1881.]

According however to some anthrométric measurements of Dr. A. Weisbach, quoted by the Times Ap. ,79, "stature and circumference of head generally stand in opposite relations to each other, although there are exceptions, as in the case of the Siamese, with low stature and small heads, and the Patagonians with great height and large heads."

A writer in "Nature" Nov. 1881 shows that large heads are by no means a sign of superior intelligence: which is supplemented by a state-

Gorilla skull.—British Museum.

ment in the Times, that policemen who are selected on account of their stature and physique

are remarkable for the large proportion of small heads among them.

The French Journal "La Nàture," says the skulls of French criminals are mostly above the average capacity, viz. 1,600 cubic centimétres, and in one instance equal to La Fontaines.

The descent of man.—The theory that man is descended from arboreal ancestors, who "swung by their tails" is very superficial, All quadrumana are not truly arboreal: the orang, gorilla, and chimpanzee, spend most of their time on the ground, mainly resorting to trees for safety.

Travellers differ in their accounts of them, according to some, the natural habitat of a gorilla and chimpanzee is rocky ground, and caves, hence the zoological name of Troglodites.

Captain Burton says the gorilla is essentially arboreal and timid, the female, unlike every other animal, abandoning her young to any enemy.

Du Chaillu says, It is only the female when nursing, her young who remains in trees. The males sleep on the ground, with the back against

a tree. He always found them on the ground, but they often climb trees for fruit, although their hands and feet are less fitted for climbing than those of any other ape. The gorilla, he thinks, is a very savage and courageous brute, with vast strength and formidable canine teeth. On the contrary, the chimpanzee flies from man, and spends most of its time in trees.[*v.ch.* xx. Burtons Trips to Gorilla Land. Wood Nat. His.]

The habits of a gorilla have a strange resemblance to those of jungle-men, who sometimes resort at night to platforms in trees, for safety, at other times, sleeping under a thatched hurdle placed against a tree, or in caves.

Many non arboreal species, such as bears, rats, and felines, habitually climb trees. Pards and cheetahs often sleep in the lower branches, while the Paradoxures typhus, or palm cat of Southern India, rests all day in the head of palms, descending to the ground at night.

The large apes seem to be only semi-arboreal species. Many instances exist where some members of an order are ground species, while some are as strictly arboreal. We have ground

and tree snakes, marsh and tree frogs, ground and tree lizards, and semi-arboreal lizards. Sitanæ are ground lizards, living in holes in the earth. Càlotes live partly in trees, while the chameleon is strictly arboreal, and has a pre-hensile tail, like South American monkeys, the only strictly arboreal species, who never quit the trees, leaping prodigious distances from one tree to another,

Man's nature resembles the pachydermata more than simia. Most of the pachydermata have nearly bare skins, some of the young are quite nude, their partial covering of hair or bristles appearing with adolescence.

Dr. Koch says, the diseases of mankind and pigs can be transmitted from one to the other, while monkeys are unaffected by such innoculations. The human stomach is more like that of a pig than a monkeys, and human flesh is almost identical with pork.

Mr. Darwin believes the human ear was probably pointed. Why the large apes and mankind have lost the power of erecting their ears.

he cannot say? It may be, although he is not satisfied with this view; that owing to the great strength and arboreal habits, of the large apes, they were less exposed to danger, and having less occasion to move their ears, gradually lost the power of moving them.[Descent of Man p. 21.]

Simia seek refuge from danger in trees, because trees are their natural place: but the advantages of arboreal life must be counterbalanced by equivalent disadvantages; and there is no reason to suppose arboreal species, are less watchful than other species. If they possessed exclusive protection, it would disturbe the harmony of creation.

The origin or use of the external part of the ear, is a very knotty problem. Snakes and birds have no external ear, yet their hearing is very acute.

Is man a beast of prey, or not?—The authority on which man has hitherto, founded his right to kill and eat animals, are the precepts of the Talmud: but if Mr. Darwin's idea of man's descent be true; it logically follows that man is only a beast of prey, and cannibalism justifi-

able, he would in that case, have as much right to devour his own kind, as other carnivorous members of the animal world have to devour one another.

To many there is something repugnant in killing animals for food, and we have a "Vegetarian Society," who believe, that flesh is not man's natural food; but that he is a frugivorian. On the other hand, it is argued, that man is adapted for a mixed diet of animal and vegetable food. "His stomach, is neither so complicated as that of the ox, or a sheep, nor so simple as the stomach of the tiger."

This kind of argument is often fallacious. Several existing races are entirely carnivorous. The Ostiacks eat raw flesh, and fish, and drink warm blood, like their pre-historic ancestors; habits quite inconsistent with their progenitors being frugivorous apés. [*v.* Mem. of M. Poliakoff J. G. S. St. P.]

The idea that some tropic isle was the cradle of mankind; because an abundance of fruits would supply all his wants, is likewise shown to be erroneous, if we inquire into the habits of

the aborigines in tropic isles. The wild jungle-men of Ceylon are carnivorians, living entirely by the chase, their chief food being venison preserved in wild honey, smoked rats, or monkeys. When these are scarce, they eat roots and barks of trees, such as the Mangifera Indica. The Mucassaquere a low type of junge-men, in S. Africa likewise exist by the chase.

Wild fruits fit to support mankind; are not so plentiful in the tropics as some imagine. The edible plantain, shadock, jack, &c. are the result of cultivation. Many wild fruits much eaten by monkeys, like the large reddish fruit of the Willughbeia martabanica, are poisonous.

It is doubtful a strictly frugivorous, or vegetarian primitive race ever existed. All the aboriginal races of India live mainly on flesh. During the great famine in 1877, the Malas of the Deccan,and other flesh eating tribes feasted on the cattle who died through want. The Australian eats any reptile in his way, although he prefers kangaroo.

There is little doubt primal man existed by the chase, and not till they cultivated the soil,

were mankind either frugivorous, or vegetarian as seen in Ceylon where some of the jungle-men have built huts, and cultivate small plots of land.

Some Teachers of humanity have sought to make the life of every creature inviolable. Chaitanya the Apostle of Vishnu; taught that the "destruction of the lowest of beings is a sin," and Buddhist devotees, strain water before they drink it, for fear of killing stray animalcules!

In our own time, Dr. Richardson gives a charming discription of his Utopia, "Salutland." "Where a man, woman or child, who in wanton pleasure would hunt down, or torture one of the inferior creatures would be cast out of society."

The avidity with which mankind hunt other creatures, especially the passion boys have to wantonly destroy birds and their nests, is very like the animal of prey, however it originated.

Had man a hairy covering?—All creatures, mankind excepted, are provided by nature with a protection against the elements; adapted to all the conditions of their existence, being denser in winter than in summer, and most artic species become white in winter, not only as a protection

from enemies, but because white is the warmest.

This peculiarity alone marks mankind as distinct from other beings. Savage or aboriginal races, all wear less clothing than civilized man, yet they are not a whit more hairy; even those natives of very cold climates, showing the bare skin cannot be owing to the adoption of clothing. The Terra del Fuegan is so hardy he lets snow melt on his naked skin, and in spite of his cold climate, remains nearly nude even in winter, only occasionally throwing a seal skin over his shoulders.

Judging by all other animals, if mankind are descended from an ape, the simian fur, instead of disappearing, should have become denser, when they migrated to cold climates.

Mr. Darwin accounts for man's bare skin, by supposing—"He was devested of hair through having aboriginally inhabited the tropics.... Our female semi-human progenitors, he says, were first probably, partly denuded of hair at a very distant period as a sexual ornament."[De. of Ma.]

In his edition of, 74 he quotes Mr. Belt["The Naturalist in Nicaranguà"] who believes that

in the tropics, it is an advantage to be devoid of hair, as it enables people to free themselves from parasites, adding in a note, That the Australians singe themselves to get rid of parasites. He however "doubts if the evil is of sufficient magnitude to have lead to denudation of the body, as the loss of hair, in some respects, would be inconvenient in hot climates, exposing the frame to chills...so that man cannot have been divested of hair through natural selection...The loss of hair would have been deemed an ornament, by our ape like ancestors. The hair in some female monkeys appears to have been removed, not for the sake of nudity, but that the colour of the skin would be more fully displayed."[pp.57 383 601.]

Mr. Darwin seems to imply, that the female apes removed their fur themselves, to increase their charms, we suppose he means it occurred through the males habitually selecting the least hairy females, partly denuded by natural causes. But how does he know a bare skin would have been admired by our ape-like progenitors?

All aborigines show, more or less, passion for

decorating themselves with feathers, skins, and tattowing, which seems opposed to the idea that primal man would have admired a nudity.

In support of his theory, Mr. Darwin quotes P. Gervaise,* who says the hair on the backs of gorillas is partly removed. This is so, with some of the specimens in the British Museum, but Du Chaillu explains, that this bare place, is caused, in both male and female, by the habit of sleeping with their backs against trees. He says the chests of the adults of both sexes, are also bare, the young being thinly covered." vol. ii p. 350.

A young gorilla almost nude has been lately exhibited at the Westminster Aquarium.

If mankind cannot have become nude, through natural selection, as it would have been injurious?—How could it have occurred from sexual selection, either? as Mr. Darwin says "we may feel sure that any variation in the least degree injurious would be destroyed." It does

* His. Nat. des Mam. 1854. Mr. Wallace in his Contributions to the Theory of Natural Selection 1870, takes a similar view to Mr Darwin's on this subject.

not seem however, to have been a very injurious variation, judging by the way mankind have survived the denudation.

Sexual selection seems to be very capricious in its operations. It has decorated some creatures with fine feathers, and a profusion of hair; and shaved mankind!

It is difficult to see how our female simian progenitor could have denuded herself? As it is well known, the more you try to remove hair, the more it grows, even when pulled out by the roots; and why? All animals cast off their epidermal appendages, at particular times, which is called moulting. The crab and snake cast their skin and shell entirely, while with mankind the process is continually going on, so that if a hair is pulled out, it is soon replaced by a new one.

Reaumur at, the end of the last century, described the curious way that crustaceans divest themselves of their inflexible cover, as they only grow during the intervals, while the new shell, which forms under the old one, is soft.

The annoyance from such parasites as fleas may be reduced by an absence of hair, but a

nude skin in a tropical climate, is exposed to the worse attacks, of leechs, red ants, mosquitoes &c. from which the hairy monkey escapes: and the unclad native of the tropics suffers as much from the heavy rain, as from the scorching sun.

The first covering adopted by mankind, was probably furs, the very thing sexual selection is said to have taken from him. Furs are a prized modern dress; indispensable in artic regions.

The Veddahs and Tahitans, however cover themselves with a scanty garment made of the Antiaris, or sack tree, bark, or the inner bark of an Artocarpus prepared for wear by being well soaked in water, and pounded with stones, till it is soft and pliable, when it is sewn together with the fibres of jungle plants.

Bishop Burnet in his Archæologia Philosophica describing the sewing of the fig leaves in Eden, says "Behold the rudiments of the tailors art!" "*En primordia artis sutoriæ!*" But it seems for the origin of "modes" we must go back to the time when—

> The female ape was divested of hair,
> To give her a more graceful air!

The Moslems have a tradition, that Adam and Eve arrayed themselves in plantain leaves, which, from their size are better suited for a garment than fig leaves as rendered in(Gen. ii. 7.) There seems to have been some confusion of ideas on this point among ancient authors, the plantain and fig, being confounded with one another: in some languages the plantain is called a fig.[v. Paludanus notes to Linschottens Voy.]

If sexual selection was so potent a factor with our simian progenitors—Why is it not found among existing quadrumana? There is even no marked difference between the sexes, as seen in other species. Mr. Darwin's theory would be more plausible if there was. Both male and female of the smaller genera, such as presbytes, have beards.

It is generally supposed that women's hair is naturally much longer than a man's; but if men did not cut theirs, there would be little difference; as seen in Ceylon, where the men never cut their hair, but twist it into a knot at the back of the head. With some N. American Indians it reaches in thick plats almost to the waist.

Here also there is a marked difference between most races of mankind and the simia, with few exceptions, the hair is not longer on the head than on the body. The Abyssenian ape has a quantity of a pale colour hanging over its flanks, giving it a very remarkable appearance.

Theodectem a very early Greek writer quoted by Strábo(xv.24.), says the black skin, and short curly hair of the Ethiopians are caused by the great heat of the African sun. Modern physiologists suppose all dark skins are the result of damp heat. [v. Spencers Sociology.]

The equality of mankind—If man is only a developed ape—What becomes of the Democratic doctrine of the "equality of mankind?" To be consistent, we must believe in cast, believe that a noble is superior to a peasant, a white man to a negro; just as a thorough bred is superior to a common cart horse.

In fact Mr. Darwin says, "handsome races or otherwise are the result of sexual selection;... many persons are convinced, he says, with justice, that our aristocracy, including under this term many families in which primogèniture has

long prevailed, from their having chosen during many generations, from all classes more beautiful women for wives, have become handsomer, according to the European standard, than the middle classes; yet they are placed under equally fair conditions of life for the perfect developement of body."[Descent of Man p. 586.]

What is this but establishing castes?—but although we believe castes, a very desirable institution; is it really the case that the aristocracy are generally better looking than other people?

If so why have, and do they, so often seek elsewhere more beautiful women as wives?

It is often remarked, that well-to-do peasants every where, have the finest physique.

A correspondent in the "Times" describing the Bavarian Passion Play says, "The humble wood carver Herr Rendle, who takes the part of Pilate, is a man of such lofty bearing and fine physique, he could pass as a noble Roman any where, without assuming a Pro Consuls georgeous corslet."

Then is it not the case that the majority of great men, have been humbly born?—but if the

relative numbers of the class to which they belonged is considered not out of proportion.(*v.* p. 18.) We also, at times, find the meanest natures among people of noble ancestry, reared for centuries amid elèvating influences. A Ceylonese proverb says. "Let none reproach a king or a beggar, as they are both beyond shame:" and Moore alluding to George IV, and Sheridan * writes—

"It sickens the heart to find bossoms so hollow,
And spirits so mean, in the great and high born."

On the other hand, the noblest spirits are to be found among the humble classes; often surrounded by every debasing influence, showing the unalterable nature of man—

The same in every age—
Whether, the savage, saint, or sage,
Of every clime and land. [Apud Pope.]

Since history was written, has there been any real physical, even much mental development?

* Note to Second edition. We are glad to find from the "Croker Papers" published lately, that His Majesty was not much to blame in Sheridans case. It seems he had given him, in one way or another £ 25,000.

Are we physically, or mentally superior to the ancient Greeks, or Romans?—Have we such a man as Julius Cæsar, or other commanding genius of antiquity among us? The researches of M. Schliemann show that the popular idea of ancient Greece, that their pre-historic ancestors were heros, and demi-gods, was not unfounded. The pre-historic Greek seems to have been quite of the Homeric type.

The mummies of Egypt have been swathed for several thousand years; are the modern * Egyptians superior to them?

Since the dawn of history mankind have been prying into the unknown, yet the great mysteries of nature are still unsolved; and we find our

*Herodotus(ii 104.)says the Egyptians were swarthy and curley headed, μελαγχροες και ουλτορικες, from which it might be concluded, the ancient inhabitants of Egypt were negroes, yet it was said till lately, when Mariette found embalmed negroes in the tombs of the II dynasty at Thebes, that none of the mummies which have been examined had any resemblance to negroes. Moore in his Epicurean, quotes several authorities to show Egyptian women were handsome. Besides Cleopatra, there was a beautiful Queen of Memphis during

modern German materialists, and scientific dreamers, who certainly have not allowed any old notions to stand in their way, who have cleared the ground around them to nakedness, who have probed to the depths, every thing within their reach: proclaiming in a mood of sullen despair as the result of all their researches the ideas of Buddha, reverting to his gloomy reveries. With all their learning, they can no more, illumine the path, or lift the veil, that clouds the destiny of man, than the Indian Apostle could 2,500 years since, when he taught that there is nothing but misery in sentient existence, and that annihilation is the greatest of blessings.

Virgil in the same strain, writes—

"Felix qui potuit rerum cognoscere causas,
Atque metûs omnes, et inexorable fatum
subjecit pedibus."—Geor. ii 490.

the VI dynasty. Herodotus (vii 70.) mentions that there were two races with curly hair, one in India like Indians, whom he calls Eastern Ethiopians, probably the blameless Ethiopians of Homer, Ody. i 23. Megasthens also compared the Bengalees to Abyssenians.

We might apply to these Germans, with a slight alteration, the words of the Abbè de la Mennais, addressed to Protestanism. "La meterialisme fatiguè s'est endormi sur des ruines."

E. Von Hartmann says "The life of man is more miserable because, more intelligent than that of other mammals, theirs is worse than that of an oyster; the best existence is that of unconscious matter!" A Reviewer of German literature in the Times Nov. 1878, says a dozen books could be named, whose writers express similar sentiments. One writes, "More knowledge more misery, every effort is a failure...what we know only diminishes our delusions, and with the lost illusion goes the pleasure.

Buddha's Dhammapada(path of virtue) contains similar ideas, for instance—

"As hunger is worse than any disease, so existence is worse than any pain, to him who has realized this truth extinction is the greatest bliss.—verse 203.

"I have run through the revolution of countless births seeking the architect of this dwelling, and finding him not, grevious is repeated birth."—verse 153.

[Trubners Edition.]

Varieties of mankind,—Notwithstanding all the

researches of Anthropologists—when and how the different types of mankind originated, is as great a mystery as ever; and as insolvable a problem as primal man. Some of the most marked types, such as the pure black, West coast Negro, the yellow skinned Chinese, and pale brown native of Western Asia, were as distinct when depicted on the monuments of Egypt, as they are to day: and which also show, how closely the modern fellah resembles his ancestors.

The readiness with which the most diverse races intermarry, shows they are only, varied descendants of one original race: and no variety of half caste is sterile. [v. p. 82.]

A Correspondent of the Times Mar. 26, 80. describing the isthmus of Panama, says "Negroes, Indians, and Chinese; black, red, and yellow, here blend not unfrequently into a hybrid race...which sinks morally lower in the scale of beings, with every new combination, and lighter shade of sickly complexion."

The Eurasians of Ceylon are a different caste, and much commended for zeal and integrity. It is a curious circumstance, that instead of the

sickly hue so remarkable among the European residents, and some of the Dutch Burghers, the Portuguese half castes are often darker than the natives.

Complete amalgamation often takes place between immigrants and natives. In Western Spanish America, emigrants from every part of Europe, are welding with the Spaniards into an homogenous race. In North America likewise; we find the strongly defined German and Irish peculiarities disappearing in a few generations, in an equally marked Anglo American type, which presents some traits of the Redman.

The Dutch imported, nine thousand Kaffirs into Ceylon, and they all settled in the island; yet no trace of their peculiar features was observable in the population when the British came.

The Tajiks an Aryan race of Kashgar, from intermarriage with the Mongols have lost their individuality.

There is likewise a general tendency in mankind to lose their nationality when they settle abroad, Anglo French are usually more chauvinist than Frenchmen. Anglo Hibernians, are

another instance, being often more anti-English than the genuine Irish, the O's and the Mac's. The Anglophobia displayed by some of them, is truly ridiculous, their patronymic betraying their Saxon origin. Moore, who in his "Memoirs of Captain Rock," refers to the number of "English rabble, infected with the leaven of democracy, who migrated to Ireland in the time of Cromwell," quotes an old rhyme which says

"By Mac' and O' you are sure to know,
True Irishmen they say.
If they lack, the Mac' or the O'
Then no Irishmen are they."

It seems very probable that mankind were originally separated by geological changes and migration, and the consequent isolation for thousands of years, would account for the variety of type and manners, in different parts of the world; at the same time, its inhabitants every where, exhibit customs which show they are of the same parentage. The Ostiaks of Siberia are the antipodes of the Pacific islanders and Terra del Fuegans; yet some of their customs are identical, such as the practice of taboo.

According to the traditions of the Indian Aryans, the cradle of mankind, more especially the white races,* was the vicinity of the Pamere Steppe in Central Asia, the highest plateau in the world, also known, as the Bam-e-Dunya, or roof of the world, and the meeting point of the Himalayan, Hindu Kush, and Kuenlun mountains; among which lay the Arya-Ratha, or Ark mountain, of the Indian Aryans.

There is nothing to show that the tropics were the primal home of man. All the great migrations have been from the north, there is no instance on record of a Southern race permanently migrating northward.

Philologists have shown that most European and Asiatic languages are corruptions of an extinct primal language, once spoken in Central Asia: and the common origin of the Deities worshipped under different names, by widely separated races is generally admitted.

Mr. Darwin thinks that although primal man

*Major Pinto says he encountered in tropical Africa, a black race of the Caucasian type, and a white race of the Hottentot type called Mucassaquere !

was probably monogamous, the male fought for the possession of the female, like any wild animal; as aborigines have no marriage laws.

Mr. Dawson however tells a different tale in his account of the Australian Aborigines (1881) among whom "the intercourse between young people, is regulated by precautions, that have hardly any parallel in Europe, and lapses from virtue are so severely punished they rarely happen...The chief object of their marriage laws, is to prevent the union of one flesh." Some of their other customs have a striking resemblance to the sanitary laws of the Jews.

According to the evolution theory mankind should gradually improve; yet, despite all the plans for "elevating the masses" primal man could barely have been a greater savage than some of the bipeds, who prowl through the jungle of bricks forming our Cities. Mr. Lecky the historian says, Greek intellect twenty five centuries ago was as superior to ours, as we are in advance of the Hottentots.

It is a favourite idea that aboriginal races are destined to disappear before the white men

but Colonel Mállery, and Professor Wilson of Toronto have shown that in N. America, "If the half-breeds are included; the native population has not, probably, decreased since the time of Columbus, while the Red mans blood flows in the veins of every class of Canadian. In Spanish America, the half-breeds are likewise very numerous.[*v.* Pro. Anthrò. Inst. 1878.]

There are many Eurasians in India, and amalgamation with the British is going on in New Zealand; although the Anglo Saxon mixes less with aborigines than other European colonists.

No doubt some races are doomed. The last of The Tasmanians has gone, and a large portion of the Australians, Maories, and Pacific islanders are destined to disappear: but the Malabar coolie, a thorough aboriginal, and the Chinese, are well able to hold their own every where.

Missionary Reports, assert that owing to the exertions of their societies, many Polynesians will be saved from extinction. Other authorities say the native population of the Sandwich isles has declined two thirds since 1832.

It has been remarked, "That a sweeping conclusion as to the inevitable disappearance of black before white is absurd: what would be the use of Africa to the world if it were so?—Yet the evolution theory leads to the inference.

Dentition of species—Teeth are uncertain guides to the habits of animals, many quadrumana, although frugivorous, have large canine teeth, while mankind; although carnivorous, have no real canines. The loris, and most strepsrhina, prey on birds; and judging by his flesh eating habits, man is more likely descended from one of them than true simia. (*v.* p. 149 152 159.)

Rats are rodents, yet they are omnivorous Most of the cheiroptera live on insects, some on fruit, others are carnivorous. Horsfield says in India, the large bats prey on the small, sucking their blood from an incision behind the ear. Megaderma lyra, eats frogs, fish, and beetles. Some fruit eating bats vary their diet with fish, caught in tanks.

Domestication quite alters an animals habits. Palm cats live in captivity on vegetable diet. An oráng will eat meat, geese live on grass,

and ducks are omnivorous; although both are naturally fish eating birds.

Horses in South India are sometimes fed with butter, milk, sugar, and boiled sheeps head to maintain their stamina.[*v.* p. 62. Elliots India.]

Canine teeth, are often only used as defensive weapons; and in many instances, seem to be quite superflous, such as the long curved tusks of the musk deer, pig of Celebes, walrus, and mammoth. Elephants are supposed to use their tusks as weapons, but very few males have any.

Mammals older than supposed,—Some recent discoveries in America, show that mammals, and birds, are not so recent as was supposed. Many of their fossils have been unearthed in mesozoic deposits, and it will probably, be found some day, that an entire creation existed at an earlier period than we have any idea. Two live bats were found quite recently in a lump of coal in a Máryland mine.

It is reasonable to believe, that in every epoch, many more creatures must have existed than fossils show. At a very early period creation was divided into vertebrates and invertebrates,

and many were the highest of their genera.

Professor Marsh of the United States, says "The four oldest known birds, are as distinct from each other, as any existing species, and we must go back to a very distant time for the origin of birds." [v. Proce. Brit. Asso. 1881.]

Some finely preserved carboniferous scorpions, recently discovered, differ in no essential respect from the existing insect, having even the hairs and hooks on the feet: even at so remote a period giving no evidence of descent from anterior species. (v. Nature Nov ,81.)

Bones of terrene animals, are only preserved when buried, and it may be concluded that such fossils, are the relics of animals accidentally buried. Bones of those who die a natural death and lay on the earth, soon decay, and we seldom find many bones of wild animals in their haunts. Some years since in S. Africa, deer and other herbivorians existed in such vast herds, the ground would have been encumbered with their bones unless they soon decayed. Bones of camels who die on their way, mark the caravan rout in the desert, but they are only recent.

Probable age of species,—Mr. Darwin says, "140 millions of years can hardly be considered sufficient, for the developement of the forms which existed in the Cambrian period."(p. 286.)

If so; how could the rest of the animal world, have been developed since then? Especially as the recent discoveries increase the difficulty of supposing they have been evolved by so slow a process at so remote a period.

The time that has elapsed during the geological periods is a mere surmise. The Tertiary period is believed, the shortest, all the strata being the thinnest. Eocene vary from ninety, to five hundred feet.

Sir C. Lyell calculates that the coal fields of Nova Scotia, which are about three miles deep, took about 396,000 years to submerge them, a rate of four feet in a century. He also says Scandinavia, is rising three feet in a century. There is proof the shores of Bothnia are rising about six feet. Finnish journals state that a rock, which was marked in 1755, two inches above the sea line is now six feet five inches above it.

The chalk deposits of the cretaceous period,

which are among the thickest of the pre-tertiary strata, vary from five to fifteen thousand feet.

An estimate from these data, of the probable time that has elapsed since the Cambrian period, varies from only ten, to twenty millions of years; and less than a million, since the tertiary era. Sir W. Thompson, quoted by Mr. Darwin makes the whole time since the dawn of life, two hundred millions, and Mr. Croll sixty.

It is supposed nearly all extant species, especially, the birds and mammals, have been either modified or developed since the tertiary period. But if we look at the number and variety of forms, estimated at three hundred and twenty thousand, it seems impossible by so slow a factor as natural selection.

There are nine thousand kinds of fish extant, and ten thousand species of insects in Ceylon alone. But take the case of the seven to eight thousand species of birds. Suppose it has taken five thousand years to produce the difference between a sparrow and a chaffinch; how many years would it take to develope the difference between a cormorant and a humming bird?

Covering of species—Mr. Darwin says, "It cannot have been of much importance to the greater number of mammals, birds, or reptiles, whether clothed with hair, feathers, or scales. Yet hair has been transmitted to almost all mammals, feathers to all birds, and scales to all true reptiles." (p. 175.)

there are more mammals without hair, than he leads us to suppose. With the exception of sloths, the numerous Edentata order, such as armàdilloes, and scaly ant eaters; are covered with horny armour: the Hystrix family including porcupines and hedgehogs, have quills; and most Cetacea are smooth skinned.

How can Mr. Darwin say, Feathers are not of much consequence to birds? Feathers are not indispensable to flying species, as bats and the much larger flying fox prove; but feathers being the lightest of known substances are evidently designed to give birds, great buoyancy with expanse of wing, and indispensable to aquatic birds, whom they enable to float with ease on the water; when species covered with hair can only keep their heads above it.

Edentata are covered with scales, but the two lowest forms of mammal, the duck mole, and porcupine ant eater, have hair, and quills! The hereditary theory fails completely in this case.

Arguing in a circle—Mr. Darwin often argues in a circle: for instance. He says, "Suppose an animal which preys chiefly on rabbits, but at times on hares, was placed in an isle along with them; and after a time, the rabbits decreased and the hares increased. Then the carnivorous animal would try and catch more hares, which would develope longer limbs more adapted to catching hares." The counterbalancing disadvantages upset the argument;(c.ch.iv.)for as Professor Owen remarks, when the hares were all destroyed, the long legged dogs would die, as they could not unearth the rabbits, or there would be a return to the previous form of dog.

But why should the rodents organism remain stationary, during the enemies transformation? —We may likewise suppose the instinct of self-preservation would alter their habits. An instance of the kind occurred in the West Indies

when the mongoos was imported to kill the rats who destroyed the sugar cane. The rats finding it impossible to rear young in holes in the ground, as formerly, now make nests in trees, while the mongooses having almost exterminated the rats, kill the planters poultry from want of food!

We must again ask why should not the hares organism change likewise, the principle is applicable to both.(*v.* p. 28 *et sequ.*) The counterbalance or dual law, called by the Gnostics the two roots (δυο ριζας) they imagined, explained the origin of evil.

Spontaneous generation,—Mr. Darwin in his late editions says he has "underrated the importance of spontaneous variability."(*v.* p. 10.)

Spontaneous variation seems as improbable as spontaneous generation. Dr. Budd remarks, If such were true then the larger animals might originate spontaneously. Animals are only propagated by the law of continued succession."

In like manner there is little doubt variation proceeds from some pre-existant or inherent cause. Although still an open question the

very few now believe in spontaneous generation. Recent experiments show that Bacilli are the offspring of invisible forms of life, generated through their union with various matter. (*v.* p. 74. *et sequ.*)It seems, to use a paradox, as if life has no beginning—and if so, can it have an end? Perhaps the vital spark passes from one form to another as they decay in the course of nature, and the Hindus may be right after all.

High and low forms—What are called low forms are all as perfect, and many more beautiful and marvellous than the higher. What beauty is displayed in the butterflies wing, the metalic lustre of the sun birds plumage, and the golden beetles elytrà? are they not more perfect than the coarse bristles of a pig? A huge ungainly mammal is less wonderfully organised than a bee an ant or fly.

Birds class lower than mammals; but flight through the air is a superior power, to locomotion over the ground. A carrier pigeon that can beat an express train, is a superior creature to an awkward chimpanzee. Unicellular beings

show the works of natures "prentice hand" are as perfect as any.(*v.* p. 15 *et sequ.*)

Variation—Mr. Darwin says "species vary more in large genera than in small, and that no two animals or plants, are identical in every respect."

This is often true; but there are many contrary instances. Squirrels are very variable and if insects have been developed from a few primal species, there must have been a vast amount of variation to have produced such a multitude of forms as now exist.(*v.* p. 27.)

A perfect identity in all respects is not so uncommon as he believes, especially among small genera. It would be difficult to detect any difference in house flies.

Variation which often seems to be the result of high organism, an effect rather than a cause; is greatest in the most complex and developed organisms, and gradually decreases, till it disappears in the lowest. No variation has been noticed in the Rotifer vulgaris, for two centuries. This creature possesses the wonderful power of revivication, from a dried up state, when placed in water, like mud fish æstivation.

Although the slight variation of complex organisms, might lead to a gradual change of form: a similar modification is not possible in unicellular beings, they could only change by an abrupt transformation into duplex, or multicellular forms. Thus the first step in evolution could not have occurred, in the way Mr. Darwin believes. It could only be an entire change of form in a single stage, like the metamòrphose of the catterpillar into the moth. (*v.* pp. 11 27.)

Super vitality—Throughout nature thère is an extra amount of vitality, that is, more than is necessary for the actual maintenance of life.

It is obvious females must possess a great reserve force, to sustain the loss consequent on the birth of young. It is likewise shown in the heavy burdens animals can carry. We could not make use of the inestimable services of the horse but for super vitality.

It is again shown in the provision every where exhibited against sterility. Much less generative power, than organisms possess would be sufficient: many more are born, than can attain adolescence; many more flowers

bloom, than form fruit; and more fruit is formed than can attain maturity.

Hundreds of species are so comparatively helpless, fecundity is their main safeguard against extinction, only a few surviving, out of hundreds to perpetuate their kind. (*v.* p. 45.)

The same superabundance of energy exists in inorganic nature. Dana and Mallet have ascertained that, one quarter of the plutonic forces of the globe would be sufficient to counteract the wearing down process tending to level the mountain, and carry the débris into the ocean.

Accepting Mr. Darwin's theory, species could not have been evolved in the way he believes, unless they had an inherent tendency to multiply in a geometrical progression—But how came beings to possess this property, which has survived every modification of organism and would therefore show a prescience in creation?

Buffon has shown that pearls are caused by a natural tendency to a superabundant secretion of nacre, to provide for accidents to the shell. The same providence extends, more or less, to

all secretions, and finding a vent some where may be the cause of most of the excentricities observable in nature, such as the musk bag, of the musk deer, the double horned Indian antelope, or the horny patch on the inner side of horses legs.

Mr. Wood in his "Natural History," mentioning the instance of female narwhals with two horns remarks, "Some peculiarity in structure probably prevented their becoming mothers, and forced their innate energies to expend themselves in the development of tusks, instead of offspring." Male and female narwhals, when young, have two little tusks in the upper jaw, which in the female, usually remain undeveloped, but the left tusk of the male, grows from seven to ten feet long.

Moulting, or the throwing off, epidermal appendages at certain seasons, may be regarded as a vent for superabundant secretions. If hair did not fall at times, it would become an inconvenient length. And if the antlers of deer that are cast annually, were not shed, they would become so large the animals could not support

the weight. The antlers of some deer are enormous, while with others, they are very small or missing; and there are many horned animals who never cast them. The horns of domestic species vary greatly, some cattle having none. Dorset sheep are horned, both male and female: the South-down are not. Domestication has made great changes, in this respect. The aboriginal Bos primigenius (like most extinct species) and the wild sheep of Asia, have immense horns.

Most animals and plants moult. Snakes cast their skins, crabs their shells, birds their feathers, and annuals their leaves wholesale; with others the process is continually going on. Hoofs and nails, claws and beaks, are likewise constantly growing longer, to provide for wear and tear or they would soon be ground off.

With species who do not moult super vitality finds a vent in divers ways, as increased fecundity, and formation of lime, often expended by molluscs on the shell. Some oysters are an extraordinary and seemingly useless thickness.

Many shells have curious spines and excres-

ences, in all probability from the same cause; such as Spondylus spinosus, or thorny oyster, and the Murex. Some people have more iron in their blood than others. Frenchmen have iodine, and Scots manganese; some have less silica, and consequently their teeth less enamel, and they soon decay. The wild horses of South America have more margarine than other horses; and some species of sheep have a tendency to deposit a great quantity of fat about the tail. (v. p. 54.)

The Murex.

Similar peculiarities in nature may account for the wonderful display of plumage, &c. of many males: or the general absence of such gay plumage in hen birds, may be partly owing to vitality being expended on the lime of the egg shells, but on the other hand some male birds differ little from the female.

If both sexes of any species, have at birth the same amount of reserve force, it is reasonable

to suppose, when the male is exempted from the losses attendant on gestation, it would produce the greater size, energy, and adornment, found in the sex.

The extraordinary precosity of some domestic species, as two year old beef and fourteen months mutton; may be owing to reserve force: as it would probably tend to a more rapid maturity under domestication, the retarding, or wearing down forces, of a wild state, such as cold and insufficent food being partly removed.

Alleged discoveries—Statements appear in News papers from time to time, of extraordinary finds; which may be noticed, although we generally hear no more of them.

A small tribe of Guaycuyòs Indians are said to exist in Paraguay, who have tails six or eight inches long; but their skins are not hairy.

Much doubt is thrown on the statement by the fact, that the Jesuit missionaries who ruled Paraguay for many years, never alluded to this tribe, who could not have escaped their observation. However even if such a tribe existed any where, their tails would be little proof of

their descent from an ape, because several species of apes have no tails, and supposing mankind of simian origin, they are as probably descended from a tail-less species as the other; which seems to have been quite overlooked by those who imagine a tail would be infalibil evidence of simian origin.

The possession of tails by a small tribe living in a state of nature, can be accounted for on Mr. Darwin's theory, "That offspring tend to inherit the peculiarities of parents."(*v.* p. 13 18.) The Burmese hairy family show similar peculiarities can be inherited.(*v.* p. 144) A child may have been born among the Guaycuyòs, with a slight prolongation of the dorsal vertebræ, and transmitted it to its descendants.

The Dorking fowl is an instance of the kind. Its fifth toe must be some recent development, as all other birds, including the jungle fowl, the progenitor of the domestic species; have only four.[*v.* p. 129.]

A cavern is said, to have been recently discovered in the Bully Grenay coal mine Pas de Calais, which contained a fossil man seven feet

high, also fragments of arms, petrified wooden utensils, and some precious stones. A second cave contained many skeletons of great size, with bones of animals. The sides of the cave exhibited drawings of men fighting huge animals.

Other human relics unearthed in America are said to be of much greater stature.

These discoveries are interisting by showiug some pre-historic races, like most other extinct species; were much larger than mankind at present. The Patagonians are supposed to be giants, but it is stated in the account of the voyage of H.M.S. Alert, they are by no means so large as described by early travellers.

Giants are mentioned several times in the Talmud, Deuter.ii. Gen.vi., and by Hindu and Greek writers. According to Ovid, the giant Ophion, one of the companions of Cadmus, was dethroned by Saturn. The giant Nagas of the Hindus, are supposed by some to mean the powers of nature, as storms and earthquakes, others believe they were semi-divine beings, who could assume the form of a serpent, like the Ophiogeneis of Strabo.(xiii.I.14.)

Notes—Page 184 In a recent Lecture on the Sun, Sir. W.Thomson says, it cannot have existed for more than twenty millions of years. "Geologists and Biologists, he says, cling to vastly longer periods; but the physicist treating it as a dynamic question,...could come to no other conclusion materially different."—which agrees with the authors calculation made from different data, before the lecture was published; and almost annihilates Mr. Darwin's theory, that "One hundred and forty millions of years would be insufficient for the development of the Cambrian forms alone!

—Page 132 In confirmation of the antiquity of mankind, Dr. H. Hicks discovered, last year, a flint implement in Cae Gwyn cave, of preglacial age, probably two hundred and forty thousand years old.

—Page 34 The keeper of a menagerie, says lions at times, abandon their young, probably their milk fails. In a Return of the number of beasts of prey, killed in Algeria for the reward offered by Government; there is only about, one lion to every ten hyænas, and a hundred jackalls.

—Page 106 If the blindness of young carnivoria is an embryonic reproduction from a marsupial progenitor; only a creative providence can explain why it passes over so many intermediate genera of mammals, to reappear in an order whose habits necessitate such a provision? Another proof of a controlling power in creation appears in the general advance of whole classes while whole classes are no more developed, than they were in the beginning.

—Page 17 A writer on stock says, A high-bred cow is the most remote from one of her species in a wild state; she needs not the strength of bone and tendon, to defend herself, nor the wind or speed to escape, from beasts of prey. She needs not the formidable head, majestic neck, deep chest and expanded lungs of the bison...The dairy farmer takes care his young stock go at their ease, but the wild animal instinctively trains its young to a great deal of exercise." There is really no analogy between the conditions of wild and tame life.(*v.* p. 80.)

—Page 33 45 When either mankind or animals

increase beyond their means of sustenance many naturally die of starvation, but the tendency of beings to increase inordinately, is a provision of nature to prevent extinction of species, although it may seem paradoxical. Mankind often ignorantly struggle against this immutable law, six try to exist where there is only food for four; instead of migrating, the natural remedy for over population.

—Page 75 An extraordinary parasite called Nycteribia, found on the bat is admirably fitted for moving through hair—How could this creature have been gradually adapted for its mode of life? [It was first described by Montague in the Trans. Linn. Soc. v. ix. p. 166.]